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No. 2—Veterinary Inspection in Bacon Factories*

D. J. ANTHONY, M.R.C.V.S., D.V.S.M. (VICT.)
BRIERLEY HILL

The Minister of Health may issue regulations and orders regarding the inspection of meat throughout England and Wales, but as the law stands at present the responsibility for the carrying out of such regulations rests upon local authorities. There is thus no National Meat Inspection Service in any of our English bacon or meat factories, nor is there anything corresponding to the services provided by foreign Governments to the competitors of the English bacon curers in the world's markets. In England and Wales the local authority in whose area a bacon factory is situated must provide such a factory with the necessary meat inspectors, but this does not imply that an efficient system of inspection is thereby set up in every bacon factory.

Whilst there are about 700 registered bacon curers, the majority are small butchers who qualify for registration under the Bacon Marketing Scheme by the occasional curing of bacon for retailing in their own shops. The number of curers specialising in bacon production, and whose premises are run on factory lines, is small, and many of them are found in rural or semi-rural districts, where the inspection of meat is almost non-existent. In many cases, whatever system exists may depend upon the factory owners themselves; the local sanitary inspector may visit the bacon factory once daily in order to condemn a certain amount of diseased meat, chiefly offal, left for the purpose after the day's killing by the factory authorities. No attempt is made to inspect systematically all the animals slaughtered, the obviously diseased meats being detained by a foreman or expert butcher until the inspector arrives. (It must be remembered that the responsibility for the reporting of diseased meat rests upon the butcher, according to the Public Health [Meat] Regulations of 1924.)

As far as an *ante-mortem* inspection service is concerned, no attempt whatsoever is made to deal with this aspect of meat inspection, for the very obvious reason that the sanitary meat inspector is incapable of examining and diagnosing disease in a live animal.

No recording of diseases found is carried out in the smaller factories, and such inspection as does exist resolves itself into the mere routine condemnation of diseased meat only.

In the medium-sized factories the inspection system is often in the charge of local veterinary practitioners acting in a part-time capacity, or else, where such factories are situated within a city boundary, the veterinary officers of the city corporation may perform the inspection.

There are few large factories with a killing capacity of about 1,000 pigs per day, and they are situated in an urban or semi-rural district. Such factories often handle cattle and sheep in addition to pigs, and are perhaps better described as meat factories rather than bacon factories. The meat industry lends itself, more than any other industry, to the efficient utilisation of by-products, and full advantage is taken of this by the larger bacon curers, so that such factories produce other commodities besides bacon, whilst breeding and fattening farms may also be attached. There are only two such factories in England and Wales, and they employ whole-time veterinary surgeons for meat inspection and other work. It is obvious that in such factories, apart altogether from the requirements of the export trade, the presence of veterinary surgeons may prove most useful, and the firms controlling these factories have employed veterinary surgeons both in a part-time and whole-time capacity for years before the Meat Regulations made it obligatory upon the local authorities to provide meat inspectors for such places.

The duties of veterinary surgeons in these larger factories vary, but their primary concern is with meat inspection, and they are expected to establish an efficient system, for which purpose they receive every assistance from the factory owners, including the *loan* of a certain number of skilled workpeople for training as "detention officers" where necessary.

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The *ante-mortem* inspection commences with the unloading of the livestock at railway sidings or, if travelling by road, at the lairages. Animals are here sorted out according to senders, and are marked with the sender's mark, so that they may be identified after slaughter. Any "distressed" or obviously diseased animals are isolated, and may be slaughtered in an "emergency slaughterhouse" near at hand and away from the main factory buildings. This is useful in case any contagious disease is encountered, as it avoids contaminating the main abattoir in the factory. As no animals having died a natural death are allowed into the factory, these dead animals are also post-mortemed, and a record kept of all diseases encountered.

Meat inspection in the factory is carried out on the basis of the Memorandum 62 (Foods) issued by the Ministry of Health in 1922. The system of slaughtering and dressing carcases will affect the method whereby such inspection is carried out. The large factories work on a "mass-production" basis, and owing to the varying numbers of conveyors in use in each factory it is not possible to give details of one method which may be applicable to all. The veterinary surgeons responsible organise their own system of inspection to suit the particular factory.

In either case use is made of detention officers, who are trained workmen, and it is their duty to note and detain carcases, etc., affected with disease or which are in some way abnormal. Such trained men are placed in certain "key" positions on the conveyors, and a system of labelling or marking, or both, is used to ensure that "detained" carcases receive proper inspection. The offal is usually inspected by these detention officers and, where the veterinary staff is large enough to permit it, carcases are examined by the veterinary surgeons, who exercise a general supervision over the whole system.

Where a number of conveyors are in use, *e.g.*, one for intestines and abdominal contents, one for thoracic contents, one for heads, and another for carcases, it will be most essential that a system be devised to enable the veterinary officers to distinguish the offal belonging to every individual carcase. This may be done either by a system of numbered labels, metal tags, or such other method best suited to the particular factory. The factory owners also have each carcase and head stamped with a consecutive number, as well as a "sender's number." Thus it is possible to trace the offal from every pig, the lot to which the pig belongs, and so back to the breeder or sender. It is of importance both to the factory owners and to the veterinary surgeons that each animal be easily identified. Whether the bulk of the gland cutting, etc., is carried out by detention officers or by veterinary surgeons, it is the latter who exercise the right to decide the amount of meat to be condemned and the use to be made of such condemned meat, *i.e.*, its utilisation for the production of non-edible fats, by dry-rendering or solvent processes.

An important branch of the veterinary surgeon's work will consist of the recording of diseases encountered. Since the institution of the Pig and Bacon Marketing Schemes this side of the work has increased in importance, as schemes of insurance are often included in the above marketing schemes. The amount of meat condemned is recorded daily, together with the diseases encountered. These daily reports are made up weekly, monthly and annually, and submitted to the local Medical Officers of Health, and factory owners. At one time it was customary to forward weekly and annual reports to the Ministry of Health, but that is no longer required, as the Ministry usually receive copies of the Medical Officer's annual report, which includes that of the factory veterinary surgeons.

In these large factories the owners provide office accommodation, etc., for the veterinary surgeons, and there is also usually a large chemical laboratory with a staff of chemists, with whom the veterinary surgeons will often find it useful to collaborate. Full use should be made of the microscope, and bacteriological meat inspection should be developed as far as facilities will allow.

In a factory where various manufacturing processes are carried on, it is obvious that the veterinary staff will often be consulted upon problems concerned with public health arising during the manufacturing of various types of foods, and for this reason veterinary surgeons will find it essential to make themselves familiar with the various stages in the production of bacon and other foods, as well as by-products.

Where fattening and breeding farms are attached to the factory, veterinary supervision may be necessary so as to prevent outbreaks of contagious disease and to avoid heavy mortality amongst breeding and young stock. In addition to his various duties the veterinary surgeon will find it profitable to collaborate with and render assistance to various research workers elsewhere, and in particular to assist in the eradication of tuberculosis by reporting heavy infections in pigs and other animals, to the county veterinary officers in the affected areas. Much of this work is, of course, voluntary, and in connection with reporting tuberculous cases, care should be taken so that the course adopted will not cause offence to the breeder and cause him to cease sending his pigs to a particular firm. Such work helps in some small way towards the eradication of

disease, and incidentally makes the work of the veterinary surgeon at the factory more interesting. In addition to the duties mentioned, the officer will from time to time be called upon to undertake a variety of tasks, and will not be able to complain of any monotony in his work.

The Legal Position.

As has already been pointed out, some of the large factories employed veterinary surgeons for meat inspection and other veterinary work long before the introduction of the 1924 Meat Regulations made it necessary for local authorities to provide the inspectors. The Public Health Act, of 1875, does not mention the veterinary surgeon as a person empowered to inspect meat, but where the Towns Improvements Clauses Act of 1847 has been adopted, then that Act does provide for a person other than the medical officer of health or sanitary inspector to be empowered to inspect meat, etc., whilst the Public Health (Meat) Regulations of 1924, define an "Inspector," as the medical officer of health or any other officer of a local authority having under the Acts relating to Public Health or any local Act, powers to inspect meat, etc. Thus veterinary surgeons can legally be employed for meat inspection purposes in bacon factories, but it takes a long time for local authorities to wake up to that fact, and most of them still prefer to "shelve" the matter by handing the work over to an already over-worked sanitary inspector, who, in turn, may delegate the duties to his assistant who is studying for his Sanitary Institute Certificate. It is no wonder, therefore, that *ante-mortem* inspection as well as bacteriological meat inspection are almost unknown in England!

In 1925 the veterinary surgeons already employed in the larger bacon factories were transferred, for meat inspection purposes, to the services of the local authority, an attempt being first made to place the duties in the hands of sanitary inspectors of the local authority, the officer of the Ministry of Health responsible for the arrangements maintaining that veterinary surgeons were totally unfit persons to perform meat inspection! (The gentleman concerned is now deceased, and it is only fair to add that his successors fully appreciate the value of veterinary surgeons in meat inspection, and would like to see an extension of their use in such a capacity.) Thanks to the factory owner concerned, and the local medical officer of the time, and to the requirements as regards veterinary certification of foreign governments, the veterinary surgeons were retained and the veterinary profession was thus not deprived of a post in the Public Health services. Since those days, the two posts have become four, and some part-time veterinary posts also exist in bacon factories.

It is obvious that in a factory slaughtering thousands of animals weekly, with supplies of livestock constantly in the lairages, the presence of a veterinary surgeon is essential, and that to entrust the meat inspection service in such a factory to a lay inspector would be a retrograde step, and would not do away with the necessity for the services of a veterinary surgeon, as factory owners have found to their cost in the past. If such factories are engaged in any export trade, the presence of a veterinary surgeon to inspect their meat becomes a vital necessity, as no foreign or dominion government will allow meat to be imported without a veterinary certificate. Thus to comply with the export requirements alone, a veterinary surgeon should have charge of the inspection service in any factory engaged in that trade.

It is well known that meat and bacon factories in foreign countries, especially those engaged in an export trade, are inspected by veterinary surgeons who are officers of the national government of the country concerned. In England, no such national meat inspection service exists, and the veterinary surgeons are local government officers. Advantage has been taken of this fact by the Canadian Government to prohibit the importation of any English meat products such as bacon and hams into the Dominion, the excuse being that there exists no national government inspection system in England, and that the veterinary surgeons stationed at the exporting factories here are all local government officers.

It is a matter of some surprise to most people that large meat factories in England, slaughtering as many as a quarter of a million animals a year, and endeavouring to compete with other countries in an export trade, should have to rely entirely for their inspection services upon the local authority, often a small urban district council, rather than upon the central government. Whilst the veterinary surgeons concerned are appointed by, and are on the staff of the local authority, their salaries are not paid from public funds, although meat inspection is part of the normal duties of a public health officer.

In the case of medical officers of health and sanitary inspectors, together with their assistants, these officers may be "approved" officers, half of whose salaries are paid from local rates and the other half from an Exchequer grant. Thus the whole of their salaries are derived from public funds.

The veterinary surgeons employed in a whole-time capacity at the larger bacon factories are paid from a fund derived entirely from the factory owners, in whose factory they work.

Where a bacon factory is built in a city area, the meat inspection service costs the factory owner nothing more than any other ratepayer, as the inspection staff is provided by the city authorities. Should such a factory be built in a small urban district or rural area, the factory owner may have thus to bear the whole cost of what is admitted to be a public service.

Thus veterinary surgeons employed at the larger bacon factories may occupy a unique position amongst public officials. They are officers of a local authority, carrying out the duties of their office like any other local government official, but their salary grants are derived, not from public funds, but from the pockets of a private manufacturer in whose factory they work!

Whether the legislators who drafted the Public Health Acts in England ever contemplated such a method of payment of local government officers is doubtful, and it is certain that, as yet, this convenient method of relieving the taxpayer does not appear to have penetrated any further into local or national government service.

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The First Session of the Public Health Section of the Congress was held in the Grand Hall, Town Hall, Bournemouth, at 10 a.m. on Tuesday, July 27th, when Mr. S. B. Vine, President of the Section, occupied the chair and a large number of delegates attended. The Chairman announced that the essayist, Mr. D. J. Anthony had no preliminary remarks to make in introduction of his paper "Veterinary Inspection in Bacon Factories" and he, therefore, at once called upon Mr. C. H. Ducksbury to open the discussion.

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Mr. C. H. Ducksbury, M.R.C.V.S., D.V.S.M., of Calne, Wilts., who opened the discussion, said:—

I would like to take this opportunity of expressing my appreciation of Mr. Anthony's excellent paper, which makes reference to all the veterinary duties in a bacon factory.

As the factories with which we are concerned are identical in their veterinary appointments and very similar in their methods of production, I find that I am in the position of confirming the major part of his paper.

Mr. Anthony has described very clearly the legal position of the veterinary appointments; further, his remarks upon how these appointments have arisen in bacon factories through the course of years are very interesting. I do not know of the employment of veterinary surgeons in any factory other than those which come under the owner concerned, who apart from any question of export trade, has a genuine desire that the animals should receive *ante-* and *post-mortem* examinations, thus placing his raw material upon the same level as that in all the numerous countries which have veterinary inspection on a national basis.

A large factory is a typical example of self-contained centralised slaughter, in which, so far as Mr. Anthony and I are concerned, all assistance is given to introduce and carry out in every detail through veterinary meat inspection those features which this country has asked for in its laws and recommendations from its local authorities and has required from those countries exporting to us. This paper shows that meat inspection in England is lacking in activity in many districts, particularly of the urban and semi-rural type, and the people appointed to carry out meat inspection may not be properly trained, neither have they facilities for the investigation of many of the conditions which are found. There would appear to be no doubt that this lack of activity in meat inspection has been observed by the Bacon Development Board, who, in providing guidance to bacon curers in their Bulletin No. 1. "Hygiene in the Bacon Factory" of 1937, state, under chapter 5, "Diseased and Unsound Meat in relation to Bacon Producers Licence Condition No. 13," that "Where meat is obviously diseased or otherwise unsound, it should be rejected notwithstanding that it may not have been inspected."

Mr. Anthony has described how in a bacon factory under veterinary inspection *ante-mortem* inspection does take place. Such inspection together with the subsequent *post-mortem* inspection concerns the most important part of inspection work because those animals which are percularly dangerous, owing to the septicaemic character of their flesh, for human consumption come under observation thereby and are properly dealt with. The Bacon Development Board again in their bulletin may have such conditions in mind when they state that "In the interests of the production of high quality British bacon, however, it is essential that no curer should produce bacon from any carcase or part of a carcase if he has reason to suspect that it is in any way unsound." I am sure Mr. Anthony will be able to confirm that under veterinary inspection this rule has applied for many years now not only to the meat but to all those animals which on *ante-mortem* inspection have shown any evidence of abnormal health. Whilst *ante-mortem* inspection is undoubtedly the work of the veterinary inspector I should like to ask Mr. Anthony if he does not think that slaughter generally should become more centralised before such inspection becomes a practical proposition.

In spite of the national character of meat inspection in the form of the Ministry of Health instructions in the Memo. 62. Foods, the administration is a local one and there is a

vast difference to be noticed in this administration in the local authorities concerned. Mr. Anthony has mentioned a National Meat Inspection Service, which undoubtedly would remove this difference. From his experience of such services in other countries I should like him to describe to us the position of veterinary surgeons in all our factories under such a service with particular reference to the inclusion in the service of those lay inspectors who have been trained and examined by veterinary surgeons. In an experience of nine medium-sized bacon factories I do not think the duties in any one would fully occupy the time of a whole-time veterinary inspector.

Whilst the factory staff, immediate public, factory visitors, feeders and producers are all impressed when they see veterinary meat inspection in operation, the hindrance to the extension of veterinary appointments would seem to have a direct bearing upon the absence of real active interest in the meat production by local authorities in their areas. Such active interest would appear to become more marked in those authorities whose goods may be transported into the larger authorities, particularly London, where veterinary inspection occurs. When goods pass from the medium-sized factories to the central factory, it is necessary, through the general inefficiency of sanitary meat inspection, to train men in the detection and may be the judgment of diseased meat in order that the factory may be protected so far as possible; further, this procedure gives protection to the central factory. With one or two exceptions my experience of sanitary meat inspection is that one visit may be made to the factory per day, when the diseased findings of a foreman and his men, under the direction of a manager, are condemned. Such findings comprise internal organs and carcases advanced in disease, so that considerable quantities of meat pass on with no inspection at all. As a contrast, veterinary inspection rises to a very high standard, in which the efficient system referred to by Mr. Anthony has no rival in efficiency in all the other thoroughly worked sections in the factory. As Mr. Anthony states, the veterinary surgeons responsible organise their own system of inspection to suit the particular factory, and I have found that for the "key" men, instruction charts are very useful, explaining the use of coloured metal discs in relation to the diseased conditions found, and the marking of a label, printed to show the complete disease findings in each animal when the examination is complete. I think Mr. Anthony will agree that it is possible to arrest all diseased conditions before the carcases and their organs pass into their respective parts of the factory, and that this does not take place in the absence of veterinary inspection or the introduction of its methods of control.

I appreciate very much Mr. Anthony's reference to the medical profession, many of whose members fully appreciate the value of veterinary surgeons and I too feel that they would like to see an extension of their use in such capacity. For the sanitary inspector, I would say that although he is so often guided by a manager or foreman as to what he should condemn I do think this state arises through other duties wholly occupying his time and that he is not able to study the science and art of meat inspection seriously and deeply. I also think that in the present general attitude towards meat inspection it may be a decided disadvantage to his progress in the obtaining of other appointments to neglect the usual duties for those of meat inspection. I have experienced great pleasure in meeting the sanitary inspectors, discussing the control of diseased goods and introducing an inspection system into the factories in their areas, yet the goods received in the central factory may still mar the veterinary inspection there, making the re-examination of these goods on arrival a necessary procedure. Now I am sure Mr. Anthony will agree that this re-examination is made too late and that, as stated before, all diseased meats ought to be arrested immediately following the slaughter, otherwise contamination may occur and, in the absence of knowledge of the extent and location of disease findings on slaughter, unnecessary examination incisions of carcases, detrimental to the trade, may take place.

Mr. Anthony has stated that the veterinary surgeon has the right to decide the amount of meat to be condemned and the use to be made of such condemned meat. In the first part of his statement Mr. Anthony is right and if only the whole of our meat industry could receive this supervision, then, working under the Memo. 62. Foods, uniformity would be established with advantage to the trade generally, but in the second part Mr. Anthony should consider the 1875 Act, where it is laid down that any meat which is condemned should be destroyed and the veterinary surgeon has no legal power to decide other than the destruction of condemned meat. Actually many bacon factories have their own by-products departments, in which their condemned goods, and may be all goods condemned under the local authority, are converted into non-edible fats and fertilisers, and in the event of shipment of these goods being made to the Channel Islands the department comes under the control of the Ministry of Agriculture who issue an annual licence.

Mr. Anthony has referred to the recording of diseases encountered and the increased importance of this work since the institution of the Pig and Bacon Marketing Schemes. I should like to ask him if he does not think that there is room for more activity amongst veterinary

practitioners in relation to the troubles encountered by the large producers who are now so prominent in the industry, and that they could be extremely helpful, working in conjunction with the research laboratories, particularly with regard to that critical period in a pig's life before and after weaning. I have found, and I believe Mr. Anthony's experience is the same, that in the ageing of the bacon pig much time and consequently increased expenditure may have been incurred in their production. I have also observed when visiting the large piggeries that once the possibility of swine fever has been excluded help is urgently needed in the existing trouble, and confidence in the veterinary practitioner is somewhat lacking.

I am not in agreement with Mr. Anthony in relation to the reporting of heavy infections of tuberculosis in pigs to the county authorities unless this procedure was agreeable to the producer and even then I am inclined to the view that these heavy infections are chiefly concerned with tuberculous mammitis in the sows, after examining litters in which generalised and tubercle-free cases are found, and the tracing of the sows concerned. What I do think important is that producers, irrespective of whether their animals are insured or not, should receive a detailed condemned certificate in relation to the disease findings in their animals on slaughter, in order that they may seek advice and avoid repetition of the conditions found.

All that Mr. Anthony has said about the employment of whole-time and part-time veterinary surgeons in the bacon factories is correct. Whilst it would naturally be in the interest of factory owners to get their local authority to provide a thorough system of meat inspection, it must be remembered that the desire for meat inspection comes from the factory owner and not the local authority, who may derive some security in the fact that, as Mr. Anthony has pointed out, the responsibility for the reporting of diseased meat rests upon the butcher according to the Public Health (Meat) Regulations of 1924.

General Discussion

The Chairman having thrown the paper open for general discussion, Mr. L. B. A. Grace (Smithfield, London) said that he was pleased to have that opportunity of adding his quota of thanks to those which had been, and would be expressed to the essayist for his kindness in presenting them with that paper, and also to the opener of the discussion. He found himself in complete agreement with all that had been said but he felt that they had been left with rather a hazy notion on certain aspects of the problem before them.

As an example, he might say that as Smithfield Market probably provided the best indication of the state of meat inspection throughout the world he could assure them that what Mr. Anthony and Mr. Ducksbury had told them concerning factories under their control, was certainly not a true reflection of the state of meat inspection throughout this country. He thought the veterinary profession took rather a complacent view as to the ability of the veterinary surgeon with regard to meat inspection; whilst fundamentally the veterinary surgeon should be the best person for meat inspection purposes, actually he was, *ipso facto*, not an expert. Until the veterinary surgeon underwent some practical training—and a fairly prolonged training—he would not be of the greatest possible value, and that applied even more in the case of the sanitary inspector.

He thought he was voicing the opinion of the members of his own staff who had qualified as sanitary inspectors in saying that they all felt that much time had been wasted in their training so far as meat inspection work went. He felt that sanitary inspection work should always be divorced from meat inspection, and until they had men who were solely meat inspectors, they could not regard the position as satisfactory. His experience with reference to meat inspection had been that it was not at all difficult to work with medical officers of health: they usually left practical matters in the hands of the veterinary officer.

He was also left with a somewhat hazy idea as to the legal position. Many of them doubtless knew and, of course, Mr. Anthony must, that the veterinary surgeon could be appointed as a sanitary inspector for the purposes of meat inspection, and therefore obtain the powers necessary for making formal seizures of meat where indicated. The unique position described by Mr. Anthony was, he thought, a rather invidious one in that the salary was paid by the person or persons whose meat was inspected. If the inspector were appointed as suggested, half of his salary would be paid by a grant from the Ministry of Health, and he would thus be placed in a more dignified and independent position.

Mr. Anthony had emphasised bacteriological meat inspection: with that he entirely agreed. He was, however, dismayed to think of the veritable gold mine of pathological material which was lost to research, and no doubt many of our meat centres could be made important laboratory centres. Turning to a point of practical meat inspection, he found that in Smithfield large quantities of meat trimmings, particularly from the region of the neck, came from the bacon factories, and from his own experience, and that of his assistants, he was bound to come to the conclusion that large quantities of diseased bacon were consumed in this country. He put it to them that it was good practice, when they found disease of the submaxillary lymphatic glands—and now he was referring to tuberculosis—to remove not only the head but the two cervical bones adjacent to the head: they found numerous cases of pigs' carcases affected with tuberculosis of the cervical glands, where the head had obviously been removed because of tuberculosis.

He was, of course, largely in agreement with the operation of a national meat inspection service, but it would be impossible to arrange it into a national system of meat inspection unless they had a reserve of men properly trained, and at present he did not feel that we had that reserve on hand.

In conclusion, he would ask for something to be done by the people concerned to inaugurate a proper course of training in meat inspection, and let them get away from that unnecessary training in sanitary inspection.

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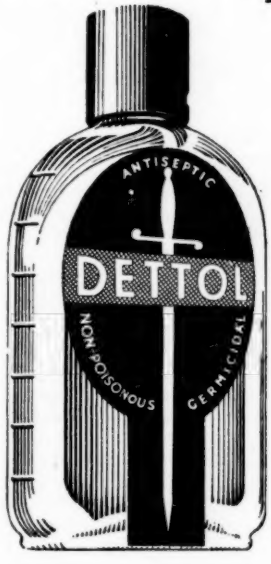

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Dr. W. A. Lethem, of the Ministry of Health, observed that they were all indebted to Mr. Anthony for stating so clearly the position of meat inspection in bacon factories. Speaking as a representative of the Ministry of Health, he could assure them that the Ministry was fully conscious of the very inadequate inspection which was provided in many of the smaller bacon factories.

Unfortunately their hands were tied by the law of the land. The Public Health Act, of 1875, entrusted inspection to local authorities, including the smallest urban and rural district councils, and there was no power to compel such authorities to provide adequate inspection. The 1875 Act mentioned "the medical officer of health" and the "sanitary inspector"—or as he used to be known—"the inspector of nuisances." In order to give veterinary officers the legal powers conferred by that Act it was usual to appoint them as sanitary inspectors. He had no doubt that if the Act were ever re-drafted the term "veterinary officer" would be included. (Hear, hear.)

There was one point on which he was going to cross swords with Mr. Anthony. The latter had mentioned towards the end of his paper, that his (Dr. Lethem's) predecessor was strongly opposed to veterinary surgeons acting as meat inspectors. He was inclined to agree with his predecessor as regards routine inspection because he held too high an opinion of the profession to think that a veterinary surgeon should spend his time in the routine examination of innumerable glands. The veterinary officer should have supervision over a staff of trained men; he should use his brains and scientific training as an administrator and supervisor and not as a routine inspector. His view was that many veterinary surgeons made just as poor routine inspectors as many doctors made poor nurses.

Some of the previous speakers seemed to have overlooked the fact that many sanitary inspectors had qualified in meat inspection by obtaining a supplementary certificate for that work, a certificate which implied a course of study and the passing of a fairly stiff examination. He thought such doubly qualified sanitary inspectors were well able to carry out routine work under the supervision of a veterinary surgeon. Many sanitary inspectors held that certificate, but there were still some districts, particularly country districts, in which the inspector did not. He found, however, on looking at the appointments that had been filled recently that it was becoming more and more common for a sanitary inspector who had to examine meat to be required to hold a special certificate in food inspection.

He would like to stress the importance of *ante-mortem* examinations. People were apt to think that because meat was cooked there was no real danger of disease in man. That was not so. He had investigated a large number of food poisoning outbreaks and had found that many had been caused by salmonella infection derived from a diseased pig. It was often difficult to discover such an infection on *post-mortem* examination alone. He felt that the only way of protecting the public from *salmonella* outbreaks was to require a rigid and thorough *ante-mortem* inspection.

Lieut.-Colonel H. A. Reid (Veterinary Representative in London of the Dominion of New Zealand) said that as representing a country which he thought might claim to be in the foremost rank of hygienists as regards meat inspection, he would like to add to that discussion by making a few remarks as to the conditions that prevailed there.

He quite agreed with Dr. Lethem as to the monotony of examining large numbers of carcases, and as to the ability of trained meat inspectors working under the supervision of veterinary officers to carry out those duties efficiently. The system employed in New Zealand was to have qualified veterinary supervisors with trained assistants who before appointment had to pass a stiff examination in all subjects pertaining to meat inspection. As far back as 1900, New Zealand passed legislation which made it compulsory to establish in all towns of over 2,000 inhabitants a public abattoir. This was a great advance on the conditions which previously exisited there and on those that unfortunately existed in Great Britain up to the present day. It meant that not only the health but the aesthetic standards were satisfied because at all those abattoirs there were not only qualified inspectors but a veterinary surgeon in charge and everyone who consumed meat in New Zealand or coming from New Zealand knew that it had been subjected to *ante-* and *post-mortem* inspection of a very rigorous character.

One speaker had stressed the fact that all diseased meat could be and should be arrested at its source. Most of those present knew, as practical meat inspectors, that that was not always possible; there were certain occult lesions that might not be observable in the course of routine meat inspection. Therefore, a further check was applied by inspection in London and other ports of entry with a view to discovering the presence of any lesions which might not have been previously disclosed.

The pathological aspect of meat inspection had been alluded to by Mr. Grace and he (Colonel Reid) quite agreed with him that further investigation was needed, because our knowledge of some of those conditions did not seem to be complete. They wanted definite information regarding the precise nature of certain of these pathological conditions; that would be helpful in establishing some form of control over infection at the source. He thought that with the number of research laboratories we now had in this country their time could be usefully employed in investigations of this kind.

He would like to thank Mr. Anthony very much for his interesting paper and also the opener for so ably discussing it.

He thought the subject was of paramount importance, especially to anyone like himself and others representing countries which largely depended on meat export.

Mr. P. F. Dolan (Dublin) observed that he wished to say just a few words on the system adopted in the Irish Free State. The pigs received *ante-* and *post-mortem* inspection. The *post-mortem* inspection was a detailed one and the carcases were stamped and the bacon was certified. All those inspections were carried out by veterinary officers.

There was an important point raised in the paper by Mr. Anthony and that was the question of the relative value of the conveyor and of the tagging system for the inspection of offals. He (the speaker) had no particular experience of the conveyor system but he could say that once the offals left a pig they might not be brought back satisfactorily to the pig in the case of a diseased organ. The system they adopted was the "tagging" system, *i.e.*, in the case of a diseased offal, the offal was tagged immediately it left the pig and there was, therefore, no

difficulty in tracing back the offal to the pig from which it came. They had special tags for the purpose. Under the conveyor system, the offal was rapidly taken away from the carcase and it was not such an easy thing to associate it with that carcase.

He would like to make one remark in connection with the observations of the representative of the Ministry of Health. He was not in agreement with him when he stated that the work of the bacon factories was not the job of the veterinary inspector. The bulk of their work, it did not matter what branch, was of a routine nature. It was the same in the bacon factory: and they must necessarily put up with those routine tasks.

He was entirely in accord with the view that the veterinary inspector should carry out the inspections in the bacon factories provided he received adequate remuneration for it.

He thought they were all indebted to Mr. Anthony for bringing forward that very important question of meat inspection in bacon factories.

The Reply

Mr. Anthony, replying to the discussion, said that, in the first place, he would like to thank Mr. Ducksbury for the way he had opened the discussion on the paper presented to them. As he had mentioned, the larger bacon factories were typical examples of self-contained centralised-slaughtering establishments, and it seemed a pity that advantage should not be taken of that fact to form in such factories the nucleus of what could eventually become a national system of meat inspection controlled by the central government.

Mr. Ducksbury had suggested that slaughtering generally should become more centralised before establishing such a system of inspection. There was no doubt that it would be quite a big problem for any government department to take over control of all meat inspectors throughout the country, but he failed to see why a start could not be made by the setting up of government inspection of meat in all the larger factories, especially those engaged in any way in an export trade, however small such a trade might be at the present time. For example, the veterinary surgeons employed as whole-time officers in such factories could easily be taken over from the control of the local to the central government, and the same applied to those veterinary practitioners who were employed as part-time inspectors in certain factories.

The smaller factories could not utilise the services of a veterinary surgeon in a whole-time capacity, but there was no reason why, in such a case, the nearest veterinary practitioner could not be employed as a part-time officer to supervise the inspection in such places.

The process could be a gradual one, the larger factories being tackled first, followed by the medium-sized and smaller factories. The experience gained from such government controlled inspection service in bacon factories, would enable the government department concerned to work out a scheme later on for the establishment of a State system of meat inspection throughout the country generally. Assuming that a government department were to take over control of the inspection in such factories, they would then be able to collect statistics relative to pig diseases and utilise such information for eradication purposes and with their research resources they could then attack in earnest many of the disease problems which were now neglected.

Under the Public Health (Meat) Regulations of 1937, as from January 1st, 1938, all foreign bacon entering this country would have to be stamped as having been inspected and passed in the country of origin, and in all probability British bacon might have to bear some such mark of inspection if it were to compete with foreign products. At present foreign bacon could be stamped as having been inspected by competent government veterinary surgeons in the producing country, whilst the British article could not bear such a label, as there was no government inspection service in any of our factories; thus British bacon competing against the foreign product on the world's markets must start at a disadvantage.

If it was possible for marketing boards to institute a levy on pigs for insurance and administrative purposes, then it should be equally possible for a government department to see that such a levy was sufficient to cover the cost of government inspection also; that was on the assumption that the taxpayer would not have to bear the whole cost. The bacon curers themselves would hardly object to such a levy if they knew that in return they were enabled to produce a government-inspected article that would not have to compete with foreign products at a disadvantage.

There was no doubt that things were moving along those lines and he felt sure that there would be little difficulty in establishing the nucleus of a national meat-inspection service in this country if those self-contained centralised-slaughtering establishments called "bacon factories" were all government inspected for a start.

Mr. Ducksbury had made particular reference to the lay inspectors trained by the veterinary surgeons in the larger factories, and asked what would be their position in a government controlled service. He (Mr. Anthony) failed to see why those people could not be used as they were being used at present, and as was the case in the large meat-exporting factories in South America, where the veterinary surgeons were government officers, but had a number of trained butchers working under their control on the inspection service. Such butchers were on the pay roll of the factories, but during the slaughtering and inspection, they worked directly under the supervision and control of the government veterinary surgeons.

With regard to the destruction of condemned meat, he was aware that under the Public Health Act, 1875, such meat should be destroyed, but since that date great progress had been made in waste elimination, in no industry more than the meat industry, and it was the practice for many local authorities nowadays to either run their own fat-rendering plants and so deal profitably with condemned and waste meats, or else to sell such meats to private firms for rendering purposes. In the larger bacon factories nothing was wasted, not even the bristles, and both edible and non-edible fats were produced. When he mentioned in his paper that the veterinary surgeon had a say in the use made of condemned meat, he also mentioned that fat-rendering process, and what he intended to convey was that the veterinary officer should see to it that such condemnel meat was passed through a process at a sufficiently high temperature to destroy all disease organisms, and that the fat produced from such meat should be classed as non-edible.

He was in entire agreement with Mr. Ducksbury's contention that veterinary practitioners could be of great use to pig producers working in collaboration with research laboratories, and as he had already mentioned, he would like to see practitioners engaged also as part-time inspectors at all the lesser bacon factories, under government control.

He noticed that Mr. Ducksbury did not favour the reporting to the county veterinary authorities. of heavy tuberculous infection in pigs, and maintained that tuberculous mammitis in the sows was often responsible for such infection. That was true enough, but it was equally true, as had been borne out by past experience, that many a tuberculous cow was responsible for tuberculosis in pigs, and by reporting such infections he had known instances where such cows had been detected, and herds tested and cleared of the disease. He had pointed out in his paper that such reporting required care not to offend the producer and cause him to cease sending pigs to a firm where veterinary surgeons were employed. County veterinary officers could usually be relied upon to use some tact in such cases. Mr. Ducksbury considered it important that producers should receive a detailed condemnation certificate for their animals, in order that they might seek advice and avoid the repetition of such conditions. Having issued such certificates for about ten years before the Marketing Boards came into existence, his (Mr. Anthony's) experience was that not one in ten thousand producers took any action to rid their herds of disease as a result of receiving such certificates. Since the establishment of insurance schemes, the producer was paid even if his pigs were condemned for disease, so there was now less inducement than ever for a producer to rid his animals of disease; hence the total lack of reduction in the incidence of diseases such as tuberculosis in pigs during the last twelve years.

He was pleased to note that Mr. Ducksbury agreed with his remarks about the unsatisfactory status of whole-time veterinary surgeons employed in bacon factories in this country, and he had tried in the foregoing observations to indicate a way in which their status could be improved to the benefit of all concerned.

Mr. Grace had referred to the veterinary surgeon and meat inspection in general, and suggested that the veterinary surgeon required more training in meat inspection, which was true enough. He was rather surprised to find that he advocated the appointment of veterinary surgeons as "sanitary inspectors." Surely that did not help to improve the status of the veterinary profession? Why not "go the whole hog" and insist upon having the veterinary surgeon mentioned in the Public Health Acts alongside the medical officer? Mr. Grace also mentioned the finding of tuberculous glands in "neck trimmings," and that was not to be wondered at when one realised how we lacked a system of inspection in the majority of factories.

Dr. Lethem had referred to the fact that we were tied by the law of the land, but he would point out that Parliament existed to legislate, and if it was possible to legislate for milk inspection, it was equally possible to legislate for meat inspection purposes. He would also like to point out that in the larger factories the bulk of routine inspection of the less important offal was performed under the supervision of, and not actually by, the veterinary surgeon. It was interesting to know that whilst Parliament might pass legislaiton such as the Act of 1847, the Treasury, a government department, could nullify such an Act by paying grants under another Act. That was an interesting sidelight upon methods of government in England!

Mr. Reid had shown how backward we were here in meat inspection as compared with the New Zealand factories. He (the speaker) thoroughly agreed with his views as to greater use being made of research laboratories. Unfortunately most of our veterinary research laboratories appeared at present to be somewhat overworked in turning out sera and vaccines; too much so, in fact, to bother about research into pig diseases.

Mr. Dolan had also demonstrated how much was being done in the Irish factories where an efficient system of government inspection had been set up. The problem of identifying the diseased offal with the pig in the conveyor system would depend upon the type of conveyor in use, and the speed at which it worked, and personally he (Mr. Anthony) had found no difficulty in getting the offal identified.

He would like to mention, in passing, that food inspection in Germany was entirely under the control of the veterinary profession, who were absolutely independent of the medical profession and even ran their own laboratories also.

He was very much obliged to the gentlemen who had taken part in the discussion and especially to Colonel Reid and Mr. Dolan for mentioning the systems in their respective countries. That only served to emphasise his point as to the lack of system here, and it was important to remember that British bacon and hams were exported and must compete with those from other countries on the world's markets, and he failed to see why British meat should compete at a disadvantage.

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The Ministry of Agriculture is to take action to prevent the spread of a pest of ticks at present menacing grouse, rabbits, sheep and other livestock in Scotland and parts of England.

Hysteria and Allied Nervous Diseases of the Dog

Discussion by North of England Division, N.V.M.A.*

OPENING PAPERS

I.—By J. D. PEELE, M.R.C.V.S.
Durham

As this paper is intended merely to provoke a discussion, I would like first of all to disclaim any intention of its being a scientific discourse or a presumptuous attempt on my part to try and teach anything to members here who are nearly all older and very much more experienced than myself.

Hysteria has been defined as a condition of dogs characterised by paroxysmal attacks of deranged consciousness or sensibility, usually manifested by crying, barking or running.

Cases of true hysteria, in my experience, are extremely rare; in fact, I can only recall one case. Of the various theories as to its cause I feel that the most likely one is an intestinal toxaemia associated with genetic trouble. It is significant that hysteria was not recorded in England before 1920 and that the great growth in the dog biscuit firms only dates from after the War. A dog's natural food is meat, and if you start substituting much of this with starch something is bound to go wrong. Add to the above intensive breeding, with the mating of close blood relations and the stage is set for the production of any abnormality. If human beings were bred in the same way we would be a race of idiots.

I consider that all these nervous manifestations in dogs, including hysteria, are due to three main causes:—

(1) A definite lesion or inflammation in the brain or meninges;

(2) Virus infection affecting the central nervous system, as is shown in the nervous form of distemper; and

(3) An increased irritability of the reflex centres, either hereditary in origin or due to the toxic effects of impaired metabolism or a combination of both.

A definite lesion in the brain is usually fairly simple to diagnose. Depending on its position, one may get affections of the gait, sight, hearing or digestive organs. These manifestations are usually permanent and one rarely meets with the transitory periods of excitement seen in a more temporary condition. Prognosis is usually bad, the best that one can hope for being that there may be no increase in the symptoms. In the absence of a definite pressure lesion on the brain or a trauma, which can be relieved, treatment is of very little avail.

The nervous type of distemper is too well known to you all to necessitate any detailed reference. The best treatment I have found is the use of serum as soon as possible, to keep the patient well under the influence of bromides or phenobarbital for three or four days and try and remove all toxic substances from the alimentary tract. Prognosis should be guarded. Chorea is a frequent sequel.

Neither of these two nervous diseases has any connection with hysteria, which must come under the third heading, namely, an increased irritability of the reflex centres.

I am of the opinion that in true hysteria and also in all the various fits, convulsions, screaming attacks, etc., which one sees in dogs, there are two causes, a remote and an exciting cause. The remote cause is, I think, largely that of in-breeding or an hereditary weakening of the brain. Without the exciting cause such dogs may go through life without showing any untoward symptoms apart from those associated with a naturally shy or excitable disposition. Let one of these dogs be brought in contact with the exciting cause and promptly there occurs an attack of hysteria, a fit or some other temporary nervous derangement.

The exciting causes are any sudden shock, nervous or sexual excitement, any peripheral irritation—such as might be caused by a bad infestation of lice or worms—teething in puppies or canker of the ear, and, finally, a reflex irritation due to indigestion or an alimentary toxaemia caused by injudicious feeding or worms.

There can be no doubt that the most frequent of these is indigestion due to bad feeding. We are trying to-day to turn the dog from a carnivorous animal into an omnivorous one. A dog's normal food is raw flesh bolted in lumps. Digestion commences in the stomach in an acid medium assisted by endo-enzymotic digestion within the meat itself. Cooking of the meat destroys this enzyme and so reduces the power of digestion. As carbohydrates and sugars tend to lessen gastric secretion, the mixture of these with a meat meal will also impair proper digestion of the meal.

The essentials of a diet are proteins, fats, carbohydrates, minerals, vitamins and water. All of these can be supplied by raw meat with fat and bones. Extra carbohydrate can be given in the form of brown bread rusks, but these should be fed separately and dry. When a dog is fed wholly on biscuits or meal there

*Meeting held at Armstrong College, Newcastle-on-Tyne, June 18th, 1937.

is a tremendous excess of carbohydrate which, after being converted into sugar, is finally stored in the liver as glycogen. As the liver can only hold so much, there comes a time when there is an excess of sugar in the body, setting up irritability of the skin and, what is more important, a functional inactivity of the liver with consequent indigestion and a reflex irritation due to alimentary toxaemia. Here is your exciting cause in the dog already predisposed towards fits. Admittedly many dogs are fed on biscuits all their lives and remain perfectly healthy, even though they are in-bred. In these cases I contend that the in-breeding has not produced in that particular case any weakening of the brain or of the mental stability.

Worms also play a large part in producing these attacks in dogs, either by acting as an irritant or by impairing digestion, or both. I have known several cases of dogs badly infested with round worms, which I have treated, and in which fits have persisted. In all these, where the owners have persevered, the fits have gradually got fewer in number and less violent and have finally disappeared altogether, although some cases may have taken six months or more before being entirely free. I can only conclude that it has taken that length of time for the dog's digestive organs to get into proper functional order again after their upset by the combined effects of parasitic infestation and improper feeding.

Treatment is usually simple and effective. Ears and teeth should be attended to and a reliable vermifuge administered. In young dogs three or four dosings for worms at three-weekly intervals and careful attention to the diet is completely successful in the large majority of cases. In bad cases it may be necessary to keep the patient under bromides for a day or two. In older dogs, if there are no worms, a good purging, followed by disinfection of the alimentary tract and then strict dieting will very soon bring about a complete recovery. The rarer cases where the exciting cause is a specific outside excitement are more difficult to control, but even in these more particular attention to the diet will always render the dog less susceptible to the sudden excitement.

To sum up, I contend that all these nervous attacks in dogs, except those due to a definite brain lesion or infection, are only seen in dogs in which there is a hereditary predisposition to such an attack and are directly brought about by a definite excitement, almost invariably traceable to the digestive organs.

I am of the opinion that, if rational selective breeding and a more natural system of feeding were adopted, hysteria and the allied nervous diseases of dogs would become a rarity.

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II.—By H. B. ALLAN, M.R.C.V.S., D.V.S.M.

Chief Veterinary Officer, Durham

I intend dealing with the problem of hysteria and allied nervous diseases of dogs more as a layman with some experience of dog breeding than as a veterinary surgeon. One hears of the many so-called causes of hysteria, such as ear mites, dietetic errors, mineral deficiency, etc.; I am quite in agreement with these theories up to the point that they supply the necessary match to the gunpowder, but they are not the basic cause of the condition. To get down to the actual cause one may, in my opinion, be on the right track if the pedigree of the animal is studied.

One may say that cases of so-called "hysteria" occur in mongrel dogs, but I think we must admit that the bulk of our cases have been in highly in-bred dogs. The pedigree of even an average registered kennel dog will probably show much in-breeding. If such in-breeding was allowed to be carried out in the human race it would result in a crop of highly deranged mental cases. In some ways this result is seen in pedigree dogs and it is particularly demonstrated by shyness and acute general nervousness. This hypersensitive state is a general curse in nearly all kennels and all breeds.

Terriers, a breed supposedly noted for their gameness, will shrink and cower when approached by people or other dogs. Many a dog would have been a champion if it had shown in the ring and not displayed a general shyness which is heartbreaking to the owner. As a general rule there is no cure for this shyness, because, as I have already said, they are bred unwittingly to be shy. The average mongrel who runs around the streets, game as can be and looking for a fight, is not frightened of people or traffic. That dog is not the result of a union of a dog with his half-sister, both in-bred two or three times to a common grandfather. You may think that I have wandered away from the point, but I am strongly convinced that this alone is the most common cause of the nervous conditions observed in dogs.

Coming to the causes which set up these manifestations of the basic condition, they are numerous, and they will probably have been enumerated by other speakers.

It is possible in individual cases to "cure" hysteria, by changing the diet, adding minerals, etc., but one is liable to have manifestations later which have been set up by some agent quite different from that which started the first outbreak.

These causal agents may act (in cases of faulty metabolism) on the nervous system after the manner of toxins, or they may be the cause

of a general debility. The result in an in-bred dog with a highly sensitised nervous system is what we term hysteria.

Turning our attention to the methods of treatment, experience shows that there are many which may be attended with success, such as changes in diet, etc. These methods, however, do not alter the basic condition one iota. The real cure is in the hands of the breeders, and it is that they avoid too close in-breeding. How closely one may in-breed without setting up what I call the basic condition, is a matter which will need some close thought and investigation. On the other hand, I am much afraid that success in the show ring will far outbalance thoughts of hysteria, shyness, etc., in the minds of dog breeders and it is quite probable that hysteria and its allied nervous conditions have come to stay. Veterinary surgeons will continue to administer remedies for the various manifestations of the condition and dog breeders will still have the shy dogs in their kennels.

There are other physical conditions met with in highly in-bred dogs which may probably be due to the same basic nervous condition which I have already suggested. One such condition, which, for the want of a better name, I call "buck-jumping," is a spasmodic bucking of the hind quarters when a dog is walking fairly hurriedly and becomes excited. The whole action from the lumbar region backwards is affected, and in some cases it appears as if the hind legs were endeavouring to touch the ears. It is a very distressing action to watch and the dog becomes easily tired. As far as I know, there is no remedy for this, and I would be interested to hear if any other member has had such cases through his hands.

While I make no apology for these notes I have read to you, I would reiterate that I give them as my opinion as a practical dog breeder and not from a veterinary surgeon's point of view.

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III.—By F. CHRISTOPHER, M.R.C.V.S.
Fenham, Newcastle-on-Tyne

The subject upon which I have been requested to talk is so large that I fear I can only afford the time to give you my own experience upon the major and rather vague item, *viz.*, hysteria. This is in itself a very debatable subject and such a tremendous amount has been written and assumed on the historical side that I think this part is better left out. Great accumulations of theory always attach to a subject the cause of which is unknown.

The symptoms of what I understand to be typical hysteria are as follows. There is fright, with sudden onset. The animal for no apparent reason suddenly begins to whine or becomes restless, and if outside may gallop off with its tail between its legs; it may bark, have a fit and fall; it may wander aimlessly and come into contact with obstacles in its path. The dog sometimes fails even to respond to its master's voice. Urine and faeces may be passed freely and unconsciously during an attack. The expression is vacant and the pupils are dilated. These symptoms admittedly may be the forerunner of distemper, but usually I think in distemper the fit is secondary and the typical distemper symptoms have been in evidence for some time previously.

Hysteria occurs at any time of the year, but it appears perhaps in excess during the warmer periods and in the more fashionable and highly-bred canines. The short-faced animal with more brain area does not appear so prone to attacks.

The suggested causes are numerous: infection by filterable virus; ear parasites; diet and alimentary disturbances; hormone imbalance; vitamin deficiencies, etc. I trust you will not think me dogmatic, but from a fairly long experience I am one of those who consider the cause to be dietetic with a sequel of vitamin deficiency and imbalance; in other words, predisposing causes affecting the nutrition of the brain, usually arising from derangement of the gastro-intestinal tract, may be associated with improper feeding and causes previously given; perhaps adding also worms, foreign bodies, teething, breeding, heredity and environment.

In biology I was taught that the dog was a carnivore and I suppose he is still classed as such; but having been domesticated so long he is certainly endeavouring to accommodate himself as an omnivore and humans are trying hard to persuade him to be one. Evolution is slow and laymen and a number of veterinary surgeons have tended to lose sight of the fact that even with his domestication the dog cannot possibly, as yet, have lost his anatomical and physiological structure. Further, the intestines of the dog are relatively short. Therefore it might reasonably be said that the food of the dog should be concentrated for the purposes of digestion and assimilation. For these reasons I suggest that raw or very lightly cooked red meat with a little fat should unquestionably be the basis of a dog's ration and I always advise it to be given immediately on weaning, gradually increasing the amount up to the time of maturity.

Concurrently with my ideas of the cause of this condition, I suppose runs prophylaxis, and here I should like to quote from the paper read at the last Congress at Scarborough by Mr. Hewetson: "If breeders would allow animals to revert to their natural type and be fed, housed and exercised according to rational principles, I believe hysteria would practically cease to exist." That, expressed in a few words, bears

out what I have maintained for the last 20 years.

The prognosis is usually favourable; a large percentage recover under proper treatment and some without medication—if attention is given to correcting the diet. We are rarely called to hysteria cases where dogs are given a liberal raw or lightly cooked lean meat diet; it is generally from owners who feed carbohydrates in excess that the calls of distress come.

Just a remark may be added about what may be termed adjuvants. Usually, from the prophylactic side, from which I prefer to treat this subject, one may advocate cod-liver oil and lime water—although I was once informed by a scientist that few foods contain vitamin D because Nature expects the human and animal to get this vitamin from sunshine. D is the only dangerous vitamin in overdose; therefore, a word of warning: if it is overdone there may arise arteriosclerosis and premature symptoms of senility.

Treatment.—In regard to treatment, I give sedatives and perform lavage, puppies receiving castor oil. The diet is changed (meat 1/20 to 1/80 per lb. body weight), with, for puppies, milk and barley water, meat marrow and charcoal.

Hysteria is undoubtedly an aggravating condition to deal with away from one's own hospital, as when clients are advised as to what we consider the correct diet for the individual canine they persist in their own methods—I presume usually as the easiest means to an end—with disastrous results.

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IV.—By J. J. McDOWALL, M.R.C.V.S.

SUNDERLAND

I propose to deal with three different types of dogs which, in my opinion, are the subjects of hysteria:—

(1) The domestic animal which for no reason at all suddenly develops hysteria; he has been getting any kind of food and possibly picking up filth outside.

(2) The kennel dog—he is kept under ideal conditions and is fed in a normal way.

(3) Greyhounds, with which I have had some considerable experience. A greyhound may give one or two yelps and run about for a few minutes, but it usually finishes up with a very severe fit.

It is sometimes said that hysteria is seasonal, but I do not agree with this, believing that dogs can get it at any time of the year. One of the worst attacks with which I have met was in December, when, I believe, lack of sunshine made matters worse. On this particular occasion it was near the close season at the track with which I am connected, and two nights before the last meeting one dog had an attack of hysteria; on the day of the last meeting about half-a-dozen dogs had hysteria and these were confined to one kennel. Within a week 95 per cent. of the dogs had developed the condition. Previously it was thought good practice to give a dose of castor oil and follow up with some mild sedative treatment, such as triple bromide and chloral hydrate, and bismuth carbonate. Originally this treatment worked very well, but in December the results were little short of disastrous. Two trainers had given castor oil to five dogs and all these dogs were dead within half an hour, having been perfectly well previously. On *post-mortem* examination nothing abnormal was found apart from acute inflammation of the intestinal tract. Lactate of magnesia in fairly large amounts was now substituted for castor oil with fairly good results. Cases were experienced practically all the time from December to February. Towards the end of February training was started again in preparation for the opening season and the outbreak died down, but when strict training commenced hysteria broke out again, with more deaths. During the height of the outbreak the mere sight of food was sufficient to make the dogs go off into hysterical barking and possibly finish up with a fit, without their getting any. In my opinion the disease was a question of diet. The amount of meat fed to these dogs had been very small; in fact, in the close season they had none at all. I noticed that as soon as they had more meat and got out into the fresh air they did improve and the epidemic cleared up, until last week, when we had one more case.

In my view, heredity plays a large part in the aetiology of hysteria. There is a tremendous amount of in-breeding in greyhounds, more so than in any other breed.

I may mention my experience in another kennel of a very nervous type of dog, Salukis. These dogs are fed in the ideal way—they have red meat, biscuits and bone meal, and during the eleven years I have known this kennel these dogs have never had hysteria, although they are very nervous animals. I believe the disease to be a form of eclampsia arising from irritation of the alimentary tract. In conclusion, I am uncertain as to whether the condition leaves any after-effects apart from what are noted in those toxic cases which die from cerebral hyperaemia.

. . . . . .

General Discussion

Mr. G. M. G. OLIVER stated that his experience of hysteria in dogs was really too small to enable him to pass an opinion as to the cause. He referred to the paper given by Mr. Hewetson at the Scarborough Congress, in which he had advised them to put diet out of their minds in

connection with suspected cases of hysteria. He (Mr. Oliver) did not immediately advise his clients to change the diet of the dog, but asked first what the diet was. Mr. Allan had suggested high breeding and in-breeding as the cause, and yet Mr. Peele had mentioned the exact date when hysteria was first recognised in this country, but in-breeding was surely a well-established trait. As Mr. Allan was a breeder he wondered if he carried out his own ideas on the subject; he was, of course, fortunate in being a veterinarian as well. If breeders found that a dog had hysteria they did not seek professional aid soon enough. He asked if castor oil was to be recommended in such cases.

The speaker referred to the cases Mr. McDowall had had in the kennels at a greyhound track and asked if this was some form of infection. He also enquired what was the dosage of bromide to be given in hysteria. He wondered if vegetables were suitable for dogs not only under these conditions but for normal feeding.

Mr. Allan replied by saying that although Mr. Peele had mentioned 1920 as being the year when hysteria was first recognised as such, he felt that it must have been prevalent before that time, although not known as hysteria. He pointed out that since 1920 Kennel Club statistics had shown a great increase, indicating more breeding of dogs and therefore in-breeding, and he felt that hysteria was the result of the continued years of such in-breeding.

Mr. J. J. McDowall (the President) stated that he usually gave about 30 grains of triple bromide together with about four grains of chloral hydrate. With reference to castor oil, three or four years ago a dose of castor oil, keeping the dog absolutely quiet and changing his diet, had been quite sufficient to effect a cure, without any sedative treatment whatever. In the particular case of the five dogs to which he had referred, the castor oil seemed to act as a poison. With regard to vegetables, the dogs he spoke of were fed on a sloppy diet consisting of sheep's head broth, the broth being made up of barley, sometimes rice, vegetables of some sort, carrots, leeks, onions, and even cabbages. Eventually he stopped including cabbage as it appeared to pass undigested through the alimentary system.

Mr. T. M. Mitchell, referring to cases of hysteria brought to the R.S.P.C.A. dispensary, said that he felt the question of diet could not be ruled out. He mentioned the dog which was fed on any kind of food from the table, and said he did not know whether that particular diet favoured bacterial growth with consequent toxaemia, but he imagined that this might be the case: Mr. McDowall had referred to nervous irritation as a cause, and that might be due to toxins absorbed from the bowels. He asked if it was possible for these cases to be border-line cases of hypomagnesaemia. In his experience many hysterical dogs more or less resembled the cow which was about to go into convulsions. He suggested that those members who had many cases might take samples of blood and see if there was any detectable metabolic disturbance. He considered it essential in such cases to alter the diet to one of wholesome raw meat, adding a little cod-liver oil to give vitamin D and getting the dogs into the sunshine, but he thought it was foolish to give sedatives to dogs already in a comatose state.

Mr. J. D. Peele, speaking with regard to hypomagnesaemia, observed that he believed that in Mr. Hewetson's paper there was a list of 27 animals from which blood samples were taken, and on examination they showed no change.

Mr. Mitchell said that he thought that Mr. Welsh had been giving calcium hypodermically to some of the greyhounds with variable results.

Mr. H. S. Elphick was afraid that hysteria cases were sometimes confused with fits due to in-breeding. He referred to Mr. McDowall's assertion that greyhounds were very much in-bred and suggested that the cases mentioned by Mr. McDowall were not true hysteria but fits due to in-breeding. Mr. Elphick went on to say that in his opinion one of the best forms of treatment for hysteria was to change the dog's quarters; the only trouble with this treatment was that frequently the dog no sooner came back to his home than he had another fit from excitement. Symptoms of bowel trouble and inflammation should be looked for before giving an medicine; if these symptoms were present and the dog was given castor oil, it would most certainly kill him; indeed it was best to give the dog no medicine under these circumstances. He had used calcium and 5 to 10 c.c. of calcium borogluconate every day for four or five days and in most cases the result had been encouraging. He did not think that feeding had very much to do with the causation of the condition, although there might be some bowel irritation. He advised all clients who had dogs with hysteria to keep them off bones and suggested that if the dog's surroundings were changed, his diet should also be changed: he had found this to be helpful. He agreed that red meat, which was soft and easily digested, was good and brown bread with raw bran was excellent, as was well boiled rice with a little minced beef cooked in it. It was a fact that if a dog on one side of the street had an attack of hysteria, a perfectly healthy dog on the other side would also have one: the trouble was certainly imitative. The dog's stomach was acidic, and therefore he would remind members that it was irritational to use much soda bicarbonate in stomach troubles.

Mr. McDowall referred to Mr. Elphick's statement that the dogs he had mentioned had in reality had fits due to in-breeding. He quite agreed that in-breeding was a predisposing factor, but contended that dogs got hysteria whether in-bred or not. He mentioned a particular instance of two or three dogs which had hysteria at five years old, never having had a fit in their lives, and which after they got over several attacks, lasting about three weeks, never again had an attack. With regard to Mr. Elphick's suggestions about feeding, Mr. McDowall said that the greyhounds had always been fed in this way: they had had brown bread with bran for years and they still got hysteria. He did not agree with Mr. Elphick that change of surroundings had a great deal to do with recovery: he contended that the case should be kept quiet in a dark kennel for three or four days.

Mr. J. Dewar stated that dog breeding was nowadays highly specialised and there was undoubtedly much in-breeding. He was inclined to the view that hysteria resulted to some extent from intestinal toxaemia. He had not had much success from the use of brown bread, but a food containing bran, raw meat and vegetables had, in his hands, been found satisfactory and no more cases of hysteria had occurred after its use. It was interesting to note that a bitch which had not received this treatment continued for some months to have attacks of hysteria, but soon after being placed on this new diet she

became normal and had never had an attack since. Mr. Dewar then referred to another case which was attended by Mr. Elphick. It concerned a litter of three puppies, a dog and two bitches eight months old. The dog exhibited hysteria and went into a fit. When Mr. Elphick arrived the dog was normal, but later underwent a series of fits, becoming unconscious, and never recovered. One of the two bitch puppies did exactly the same thing and Mr. Elphick removed the case to his infirmary, where she was kept under observation for eight days, at the end of which period she died. On *post-mortem* examination slight inflammation of the cranial membranes was detected. These cases were surely of a different type. Another marked symptom in certain cases of hysteria was what might be termed buck-jumping: the animal made peculiar convulsive movements similar to those of bucks. Mr. Dewar felt that this indicated a derangement of the spinal nerves.

Mr. Peele drew attention to the difficulty of diagnosis, and asked if he was correct in assuming that a dog was affected with hysteria if it had a definite fit: personally, he would not regard that as hysteria, but merely as a fit. It seemed unsound to attempt to turn a carnivorous animal into an omnivore: meat and cereal foods should be fed separately.

Replying to Mr. Dewar and Mr. Peele, the President said he believed there were three different types of hysteria which might be classified as hyperacute, acute and chronic. After apparent recovery from an attack, some dogs might show acute hysteria on hearing any unusual noise, this indicating some lesion or hyper-sensitiveness of the brain.

Mr. Oliver asked Mr. Elphick if Mr. Dewar's bitch placed under observation for eight days had run a temperature, receiving the reply that the temperature throughout remained normal.

Mr. J. R. Rider thought that no one seemed to be clear as to what they were dealing with in cases of so-called canine hysteria. Genetics, show breeding and many other causes had been implicated, and there could be no doubt that genetics supplied an important contributory factor; he instanced the great change in the character and outlook of the Airedale dog brought about by selective breeding during the past 30 years. Mr. Rider was surprised to hear that the temperature remained normal throughout the course of hysteria, as in a case dealt with by himself he found, on taking the temperature immediately after recovery, that it was 107°. He was of the opinion that foods and feeding were connected with the onset of hysteria, and it might well be shown that toxaemia from the bowel was the important precipitating cause.

Mr. Lyle Stewart stated that the definition of hysteria left much to be desired; its diagnosis, therefore, must still be a matter of some doubt. For example, it was difficult to believe that the hysteria evinced by mad excitement, running and screaming was the same disease as one causing the dog to assume a comatose state. On the other hand, it might be a second stage in the same disease process, the brain cells, etc., becoming as it were polarised, due to their enormous activity. The only way to settle the point was to employ the aid of the pathologist and to set up some searching controlled experiments, and he was very glad to hear from Mr. Allan that a fund had now been inaugurated by *The Field* which had this object in view. The speaker referred to outbreaks which he had seen among sheep dogs. In this case he had formed the impression that feeding was most likely to be the cause. These dogs were fed with little meat, their staple diet being porridge made of maize.

Mr. Atkinson spoke of hysteria as it impinged on his particular province, namely the Contagious Diseases of Animals Act. If rabies ever broke out again in this country he foresaw some difficulty in differential diagnosis, as the rabid dog frequently exhibited symptoms almost identical with hysteria.

The Veterinary Record

August 28th, 1937.

The Veterinary Officer and The New State Service

THE individual likely to be most affected by the reorganisation of the Centralised Veterinary Service is the veterinary officer of the local authority. In this reorganisation we have been assured by the Minister of Agriculture that every care will be taken to ensure that there is a minimum of disturbance, that these officers shall suffer as little inconvenience as possible and that they will be utilised in the new organisation in such a way as to retain for the State the value of their particular specialised careers. No doubt hardships will arise, but it is to be hoped that these will be few; nevertheless, it will be advisable for individuals suffering as the result of reorganisation to communicate with the Secretary of the N.V.M.A. so that the Association may do all in its power to readjust the balance in favour of the individual.

Veterinary officers of local authorities will be the first to welcome co-ordination upon a national scale of their activities as regards control of disease of animals, but they are sorely disappointed, as indeed is the profession as a whole, with the lack of any serious effort to effect a similar unification in the services of meat inspection and of milk production and control. The profession is convinced that any step which may in any way lessen the amount of veterinary control in these services is bound to react sadly against their efficiency. The reorganisation of the profession following upon the Agriculture Act will need to be watched with great care lest such reorganisation react adversely against the effective prosecution of the duties of the veterinary officer in public health.

Some effort has been made by the Government to allow for the division of the

duties of a veterinary officer between the State disease control work and local public health work by the provision of Clause 18 (3) of the Agriculture Act whereby "for the purpose of enabling local authorities to discharge their functions in relation to public health, arrangements shall be made . . . for placing the services of veterinary inspectors at the disposal of such authorities . . . ." Whether such arrangements will prove satisfactory to the local authorities remains to be seen. In any event it would seem likely that under present conditions the larger municipalities will continue to employ their own veterinary officers for the discharge of their public health functions concerning meat and milk.

In the matter of financial loss to individuals the Ministry believes that the absence of any provision in the Agriculture Act for the payment of compensation for loss of office or diminution of salary or fees does not in reality constitute a hardship, for it is anticipated that no such hardship will arise. Arrangements have been made, however, for the Association to bring to the notice of the Ministry any hardships of this character should they arise.

Finally, the profession was glad to learn from the Minister himself that, subject to Treasury sanction, the Ministry intends "to interpret the age limit of men now established in the service of local authorities as liberally as is humanly possible."

We may express the hope that, with the exercise of due care during the period of reorganisation, no veterinary officer, whether he was previously a servant of the State or of a local authority, will feel any sense of grievance but that every officer may, in the words of the Minister, find himself fitting "into the machine where he can work with credit to the whole enterprise and with great happiness to himself." If such a spirit can be established the enterprise itself will have every chance of attaining ultimate success.

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The Pig Industry

IT is estimated that the pig industry represents trades having an aggregate annual turnover in the neighbourhood of £100,000,000. In addition the industry has shown itself capable of expansion, and whilst we in these islands may not hope to be able to support enough cattle to render us self-sufficient as regards the production of beef, it is believed that with efficient organisation we can become self-supporting as regards pig products.

Some few years ago an attempt was made to organise the pig industry, following upon some comprehensive reports and surveys. The Marketing Schemes came into being with the setting up of a producers' "Pigs Marketing Board," the curers' "Bacon Marketing Board" and later on the Bacon Development Council to supervise the activities of the first two. The weekly fluctuating price of bacon pigs was abolished and a guaranteed contract price set up, based upon the price of pig food, and subjected to certain grading and marketing requirements, the whole being designed to provide the producer with an economic price for his pigs and a stable market, whilst the bacon curer was protected by import quotas on foreign bacon. At the same time the grading requirements were such as to encourage the production of a commercial pig rather than any particular breed.

These schemes ignored entirely the fact that pigs are bred for pork production as well as that of bacon, and as the bacon pig only was dealt with, a large gap was left, with disastrous results to the Pig Marketing Scheme. Whilst the contracting producer paid his marketing levies and received his contract price, the non-contracting producer was able to dispose of his pigs in the "open" market, pay no levies, and receive a much higher price for his animals. Later the contracting producer complained that the contract price was hardly an economic one owing to the rising price of foodstuffs, and that fact, together with the fact that the non-contracting producer was reaping a rich harvest in the open market, caused many a loyal producer to give up pig breeding. The result was seen when the 1937 contract came to be negotiated, when although this contract was one of the best given to the producer, the number of pigs contracted for failed to reach the minimum desired. No new bacon factories were to be built until the present factories were working to full capacity, but at no time during the operation of the scheme did the present factories receive enough pigs to enable them to utilise their factories to their full capacities. The shortage of contracted pigs forced the bacon curers to go into the open market to make up deficiencies and keep their factories working, and in doing so they had to pay a higher price for these "free" pigs than they were paying for the pigs contracted for under the scheme. It was inevitable, therefore, that the

1937 contract should be cancelled. These various Boards are still in existence, and pig grading is still carried out by the Pigs Marketing Board officers. Since the beginning of this year the Pigs Board has been living on its reserves, awaiting the production of a new scheme, which the Government have promised, but which so far has not materialised.

The Reorganisation Commission for Pigs and Pig Products reported in 1932 that the progress and development of the industry was retarded by losses from diseases, and the Pig Industry Council recommended, amongst other things, the establishment of a central research station, the introduction of a system whereby the veterinary profession and the pig industry may be made acquainted with the progress of research, and the control of sera and vaccines.

So far none of these recommendations has been acted upon. Even the marketing schemes dealt only with one type of pig, and whilst a scheme of insurance against the condemnation of diseased meat was at first included in the pig scheme, it carried with it no guarantee of proper veterinary meat inspection in bacon factories, nor did it contribute one iota towards the problem of disease eradication. On the contrary, it is believed by many that such an insurance scheme makes producers careless as to whether their animals are diseased or not, as they will be paid for their products in any case. Later the insurance scheme, after being almost "ridden to death," was abandoned and it was left to the individual bacon curers to institute their own schemes if they cared to do so.

These schemes, with all their imperfections, showed the possibility of organising and expanding this valuable industry, and there is no doubt that a comprehensive scheme, covering all branches of the industry, would be of great and lasting benefit to the country as a whole.

Pig diseases seem to show no diminution year by year, and this applies especially to tuberculosis in pigs. There is no question as to the urgency of carrying out the Pig Industry Council's recommendations as regards diseases and the veterinary profession, etc. It seems a pity that the problem of veterinary meat inspection in bacon factories should not also be dealt with. There are about 700 registered bacon curers, but of these not half a dozen have veterinary inspection. Were the problem of veterinary meat inspection in such factories seriously tackled, and the nucleus of a national meat inspection system thereby set up by appointing veterinary practitioners as part-time inspectors and advisers to such factories, the practical knowledge of pig diseases so gained, and which under present conditions is only available to a small minority of the profession, would then be thrown open to hundreds. This would be of great benefit to the profession as a whole, and thereby satisfy to a large extent the second recommendation of the Pig Industry Council mentioned above. It is, of course, true that this question of meat inspection in bacon factories is at present a matter for local authorities under the Public Health Acts, and must therefore be divorced from all pig marketing schemes. People who reason thus forget that Parliament exists to legislate, and that if it be possible to institute a Government system of veterinary control over the tuberculous cow, it is equally possible to institute a similar control over diseased pigs.

Whatever new scheme the responsible Minister may eventually introduce, it is to be hoped that it will be one in which the mistakes of the past have been corrected, and that it will be sufficiently comprehensive to include all factors affecting this important industry—in particular, effectively handling the disease problem once and for all time.

PITUITARY EXTRACTS AND GASTRIC ULCERS

In a recent issue of *Nature*, attention is drawn to a series of papers by Professor E. C. Dodds, working with various collaborators (Proc. Roy. Soc. B. 123. 22. 1937), in which is given a full account of some interesting observations on the effect of extracts of pituitary on the stomach.

"It has been found that extracts of the posterior pituitary containing the pressor principle produce gastric ulcers when injected in large doses into various animals. This observation provides a new way of studying methods of treating gastric ulcers. The production of ulcers appears to be due to the fact that the extracts inhibit gastric secretion, whether this secretion is due to histamine, insulin, sham feeding or pilocarpine. The action is primarily on the volume of the juice secreted. A continuous secretion of juice is probably necessary to protect the mucous membrane. A method is described for recording the gastric secretion and the blood flow simultaneously in an anaesthetised cat's stomach. Stimuli causing secretion induce increased blood flow and if the increase in blood flow is prevented, secretion does not occur. The injection of pituitary extracts inhibits both blood flow and secretion. In normal animals blood flow and secretion are closely co-ordinated, but after hypophysectomy this co-ordination disappears. The possible significance of these results is widened by the observation that pituitary extracts have a similar action on pancreatic secretion. These facts are possibly related to the action of these extracts on the excretion of urine."

CLINICAL COMMUNICATIONS

Paramphistomum cervi in Sheep

J. F. CRAIG AND G. O. DAVIES
DEPARTMENT OF VETERINARY PATHOLOGY,
UNIVERSITY OF LIVERPOOL

According to Cameron,[1, 2] "the genus *Paramphistomum* of ruminants is the most widespread (of Amphistomes), the species *P. cervi* being more or less cosmopolitan. It has been recorded from Britain, but the evidence that it is indigenous here is unsatisfactory. I have found it on a number of occasions in cattle slaughtered in Scotland, but in every case the animals proved to be Canadian store cattle. *P. explanatum*, a related species, occurs in Africa, Asia and Australia, but the common species in Africa is *P. cotylophorum*."

According to Baylis,[3] "*Paramphistomum cervi* (Shrank, 1790) appears to be chiefly an African form, but has a wide distribution."

Neveu Lemaire[4] states the geographical distribution to be very extensive—Europe (Corsica), the entire African continent, Madagascar, Asia (Cochin-China, Annam, Tonkin) and the United States.

Mönnig[5] refers to this worm as occurring mainly in Africa and also in other countries.

On June 17th of this year the presence of these worms was detected in the viscera of a sheep coming from Birkenhead.

The history associated with the case was that for some time losses had been incurred at varying intervals in sheep at pasture on certain fields in Cheshire. The pasture comprises about 80 acres divided into four fields and the land has not been cultivated for many years. The pasture is rough but fairly luxuriant and the flock grazing on it consists of about 100 lambs, wethers and ewes. The flock is being frequently changed and the sheep do not remain on the pasture for more than a few months. Within the last four or five years about 100 sheep in all have been lost and the deaths appeared without reference to sex or age, and occurred after a very short illness. The animals were often only seen down and if raised would stagger and fall. There was no diarrhoea. In all cases it was noted that the condition of the animals was good. Viscera from one dead sheep were brought to the Department for examination by Mr. Mackay, M.R.C.V.S., Birkenhead.

Lesions.—The following lesions were found:—

Liver. Friable and light brown; lobulation distinct.

Kidney. Capsule readily stripped off; cut surface pink and oedematous.

Lungs. Some pneumonia and fibrinous pleurisy chiefly affecting the apical lobe of the right lung. Consolidated portion of the lung grey in colour.

In previous cases no pneumonia was noted.

Heart. Normal; contained some red blood clots.

Rumen and reticulum. Full of grass. Mucosa reddened in anterior portion. Numerous small pink trematodes (*Paramphistomum cervi*) attached to the wall of the rumen, particularly in the anterior portion between the papillae; some also in reticulum and a few in abomasum.

Abomasum. Nearly empty. Mucous membrane deep red almost throughout. An occasional Haemonchus present.

Intestines. Mucous membrane deep red, especially in anterior portion of the small intestines and in streaks and patches in large intestines.

Microscopic Characters of Sections:—

(1) Liver. Columns of liver cells well separated in the lobules and many of the cells hydropic. No fatty changes present.

(2) Lung (consolidated portion). Blood capillaries congested. Acini distended with fibrinous exudate and some catarrhal cells and leucocytes. In some bronchioles the lumen was crowded with catarrhal cells and leucocytes.

Bacteriological Examination of the Consolidated Lung.—Varied bacterial flora but no pasteurellae.

It is probable that the pneumonic complication was accidental since in previous cases examined by Mr. Mackay no lung lesions were present.

The cause of the gastro-enteritis has yet to be explained. There was no evidence in films or culture from the blood, liver or lungs of pasteurellae and that cause may therefore be eliminated.

In the contents of the stomach, grass appeared to be the only constituent and no poisonous plants were detected on the pastures. Moreover, arsenic was not used for the dipping of sheep. The fact that the deaths were not occurring at or about the same time suggests that chemical irritants were not operating. They are being met with at irregular intervals.

Whether the trematodes were responsible for the losses has yet to be determined. It is significant that trematodes were readily discovered in a subsequent case by Mr. Mackay after his attention had been drawn to their presence in the above instance.

It may be added that Cameron states that "while adult paramphistomes are to all intents and purposes non-pathogenic, they are far from

non-pathogenic in their immature stages when they are living in the small intestines," where the changes they set up "may develop into a haemorrhagic or necrotic enteritis." The source of the infestation has not been determined. The fields on which the sheep were grazing have not so far as can be ascertained been used for Canadian cattle.

The main characters of the trematodes identified as *Paramphistomum cervi* are as follows:—

Small thick conical worms, pink in colour when fresh, 6 mm. long and 2 mm. broad, slightly concave ventrally and convex dorsally. A large round subventral sucker at posterior end of the body. Anterior sucker very small. Pharynx absent. Oesophagus behind oral opening and very thick walled. A few small papillae behind the mouth. Genital pore situated near the anterior fourth of the body on the ventral aspect. Intestinal caeca undivided and long. Testes double and tandem. Eggs ovoid, 0·162 mm. long and 0·08 mm. broad.

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Thelazia lachrymalis in a Horse

J. F. Craig and G. O. Davies

Department of Veterinary Pathology, University of Liverpool

Ten specimens of small nematode worms were brought to the Department by Mr. J. C. Baird, B.V.Sc., M.R.C.V.S., Corporation of Liverpool, and the following interesting history is given by him regarding their origin and the symptoms they set up and the treatment adopted:—

"A cart gelding, aged seven years, purchased in Oxfordshire in August, 1936, in town since then, was exhibited on May 29th, when the eye was normal.

"The following morning the eyelids were swollen and painful—hot fomentations were applied.

"On May 31st the swelling had increased and examination of the eye was made under local anaesthesia, as the animal resented the eye being touched.

"There was considerable thickening of the upper eyelid but congestion was not a prominent symptom, although present. A small quantity of purulent material was to be found at the nasal canthus. The examination on this occasion revealed on the surface of the cornea a few white threads, which were removed by means of a moistened swab of cotton-wool. The threads proved to be the parasitic worm *Thelazia lachrymalis*.

"The eye was again examined under local anaesthesia on the following day, when there was little change, and a number of worms were removed. The examination was repeated on the third day, when again a small number of parasites were removed.

"The swelling and pain gradually disappeared and no further parasites were found.

"The treatment, in addition to removing the worms from the eye, consisted of hot fomentations and washing of the cornea with normal saline. Improvement was gradual and the eye normal in about ten days.

"The total number of parasites removed probably did not exceed 15, and it is impossible to say if they were all present in the conjunctival sac from the beginning, being either hidden or too small to be seen, or whether they came into the conjunctival sac from some other part, such as the lachrymal ducts.

"Only one eye was affected, the most interesting features being the marked swelling of the upper eyelid and the degree of pain which accompanied it."

The specimens when examined were for the most part incomplete, but they corresponded in the main with the description given by Baylis for *Thelazia lachrymalis* (Gurlt, 1831). The worms were white and thread-like and were approximately 15 to 18 mm. long. Transverse striations of the cuticle were pronounced; buccal capsule shallow, oesophagus long and thick walled, vulva at the anterior portion of the body; spicules two in number and of unequal size; pre-anal and post-anal papillae distinct; free larvae in the uterus of the female. The tail of the female was bluntly pointed.

It is remarkable that only one horse in the stud presented any symptoms and that these worms were not noticeable in any of the other animals.

A significant point seems to be that the horse had been on exhibition a short time before the symptoms occurred, when it was in contact with other horses.

We have been unable to find any reference in recent years to cases of the kind having been recognised in this country, and that is the main reason for this note.

ABSTRACTS

[Purpura Haemorrhagica in the Horse. (Contribution à l'étude du Syndrome Anasarque chez le Cheval.) Bontems and Florio. (1936.) *Rev. vét.* **88.** 185-200.]

After many years' experience of this condition, the authors have come to the conclusion that it is of the nature of an anaphylactic shock, produced in all probability by the infection that invariably precedes it, and that the only practical method of prophylaxis is the rational treatment of this condition. In the treatment of purpura itself, the authors claim a considerable measure of success for "autohaemotherapy," namely, the withdrawal of blood from the horse and its reinoculation subcutaneously. Eighty to 500 c.c. of blood are taken from the jugular and inoculated at once in 20 c.c. amounts in different parts of the body. A much higher percentage of recoveries is claimed for this method than can be obtained by the use of antisera of various kinds, formalin or other drugs.

A. W. T.

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[Some Observations on Sterility in the Mare. Ralston, A. G., Capt. R.A.V.C. (1936.) *J.R.A.V.C.* **7.** 2. 66-74.]

The writer, who has evidently considerable clinical experience in the diagnosis and treatment of sterility in the mare, presents in this paper his views on the aetiological aspect of the condition, the correct procedure as to clinical diagnosis, a detailed account of the technique employed in the examination of the sterile mare, a summary of the suggestions to be recommended in prevention, and a short description of the treatment to be adopted in the various pathological conditions encountered.

Infection is considered to be of secondary importance: the organisms found in the vestibulo-vaginal tract are stated to be "banal micro-organisms . . . found in the normal mare." The author quotes Edwards to support this view and adds that "the efficiency of the whole reproductive process depends on the normal functioning of the endocrine system, and it has been proved that the latter will break down when certain vitamins and minerals are deficient in the diet."

To arrive at a correct diagnosis it is necessary to make a careful enquiry into the history of the case, method of feeding and general management. Clinical examination must not be confined to the genital organs. Prophylactic measures are directed towards good hygienic conditions and well-balanced food ratios with a sufficient vitamin and mineral content. Prevention of sterility in the adult mare should begin with the weaned foal, as it is necessary to maintain a high state of health in the new-born animal during the period of development of the reproductive system.

As to treatment, the writer gives his own experiences with the various methods recommended, including the proprietary preparations "Spuman" and "Parat leaves." He briefly describes Dr. Cassius Way's operative technique in the treatment of ovarian cysts.

P. E. M.

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[Artificial Abortion without Loss of Fertility in Bitches. Benesch, F., and Fellinger, K. (1936.) *Wien. tierärztl. Mschr.* **23.** 607-619.]

To cause abortion in bitches unsuitably mated, the authors experimented with an operative method in which a pliable metal catheter was inserted into the uterus through the vagina, the uterus being exposed through a laparotomy wound in order that the cervix might be held steady while the catheter was pushed through and in turn through each embryonic sac—still under control through the opening in the abdomen. In most of the seven cases a small amount of silver nitrate (0·025 to 0·1 per cent.) was injected into each embryo, but it appeared that this is unnecessary.

Practically no reaction followed the operation. There was very little vaginal discharge and the operation wounds healed up normally. Examination of some of the dogs about 30 days after operation showed that involution of the uterus had occurred and that only slight traces of the embryos remained. Other cases were sent home and were mated again and brought forth normal puppies.

All the animals were operated upon within 30 days of conception.

J. E.

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[Intestinal Torsion in a Dog. Krippel, F. (1936.) *Wien. tierärztl. Mschr.* **23.** 765.]

A year-old dog suddenly showed great pain while playing with its owner. On examination some twelve hours later it was very ill, with very pale mucosae, thread-like pulse, shallow costal respiration and tympany with great tenderness of the abdomen. Death soon followed. On *post-mortem* examination the small intestine was found to be twisted 360° and the intestinal wall of small and large intestine showed haemorrhagic infarction; there was much red fluid in the abdominal cavity.

J. E.

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[The Treatment of Eczema in the Dog with Methylene Blue. Roussel and Nouyen, van B. A. (1936.) *Rev. vét.* **88.** 32-35.]

Intravenous inoculations of a sterile 2 per cent. solution of methylene blue, in 5·0 c.c. doses, are given every two or three days. The

REVIEWS

[**"Handbook on Poultry Diseases."** Issued by the National Veterinary Medical Association of Great Britain and Ireland, 36, Gordon Square, London, W.C.1. Free to members. Additional copies, and price to non-members, 10s. 6d. Obtainable by members of the profession only.]

The object of this handbook is to present in a concise form the most important facts known regarding diseases of poultry. The committee responsible is to be very warmly congratulated on the results of its efforts, and it is not too much to say that the handbook cannot fail to stimulate a very much increased interest in poultry diseases and that it is one to which frequent reference will be made. The intention of the committee to add to it from time to time will be welcomed by all.

The poultry industry has now attained considerable importance and it is estimated that the value of poultry products exceeds £30,000,000 annually. It has also been authoritatively stated that the losses through disease in poultry amount to several millions annually. As a result, considerable research in poultry disease is being carried out in this and other countries. It has been shown that many of the infectious diseases can be effectively controlled, whilst diseases of non-specific character can be definitely attributed to the continued breeding and management of stock for immediate economic gain without due attention to its effect on general health and stamina. Poultry diseases offer, therefore, yet another avenue in which the veterinary profession may be of service.

The first section of the book is on poultry husbandry and, though brief, deals effectively with all the more important aspects of which a knowledge is essential in order that practical advice may be given on the control of poultry disease. The succeeding sections summarise concisely the state of our knowledge on each of the more important diseases of poultry and the latest devised methods of control.

It is unfortunate that the organism of fowl typhoid should be referred to as *Shigella gallinarum* on page 18 and as *S. sanguinarium* on page 23; whilst no indication of the disease concerned is given for the illustration on page 28. These are, however, minor points and do not detract from the great value of the whole. The printing and illustrations are excellent, but we feel that the make-up, though it has the advantage that future contributions can be inserted in their appropriate places, will not stand up to the wear which will result from the constant reference this book will undoubtedly receive.

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[**"Nematodes Parasitic in Animals."** By Geoffrey Lapage. Methuen's Monographs on Biological Subjects. pp. x+172. (1937.) F'cap. 8vo. Price 4s. 6d.]

Within recent years few subjects in the field of biological science have made such advances as helminthology, and this progress has been largely due to the stimulus of the needs of mankind, such as the production of food and the cure of disease, both human and animal. The need for a solution of problems of an economic rather than an academic nature has resulted, in many instances, in a reversal of the more usual course of events in which research in pure science has preceded the application of that science to some field of human endeavour. Thus, many workers in helminthology have been inclined to acquire specialised knowledge in those directions more immediately concerned with their own particular problem and to neglect advances made in other lines. Under these circumstances, Dr. Lapage's book should prove very helpful, for he has given a remarkably concise yet comprehensive survey of the more important aspects of the biology of nematodes parasitic in animals, although he states that "a small book like this cannot do more than briefly summarise a fraction of the literature" dealing with the subject. Throughout, emphasis has been laid on the nematode parasites of domesticated animals and humans because they "are among the most efficient and effective of the animals that debilitate and destroy both man himself and his domesticated animals" and because they have been more extensively studied than the free-living and plant parasitic round worms.

Chapter I is a very useful introduction, beginning with an account of the general structure of a round worm, proceeding to a brief description of the life histories of parasitic nematodes, and concluding with a skeleton classification to indicate the systematic position of the species mentioned in the text. It is pleasing to observe that the author uses names which are believed to be correct according to the rules of the International Commission on Zoological Nomenclature, although this may be

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pruritus stops after three or four injections, and a complete cure is effected after seven or eight. The history of four severe cases is given, in which the usual treatment had no effect, but which were completely cleared up after a series of injections of methylene blue.

A. W. T.

confusing to some who are more familiar with other names which have enjoyed long, though incorrect, use.

Chapter II deals with the physiology of nematodes. Under the heading "Nutrition and Effects on the Host" the author discusses the food of the free-living and parasitic larvae and of the adults and the nature and cause of the anaemia ascribed to nematode infestations. The oxygen requirements of the eggs, larvae and adults come next under review and the chapter concludes with a discussion on the protein- and fat-metabolism and excretion.

There follows, in Chapter III, an account of the present state of our knowledge of the resistance of the host to nematode infestations, in which the author deals successively with natural, age, acquired and induced passive resistance, hypersensitiveness, intradermal, precipitin and complement-fixation tests, factors that may lower resistance and finally the nature of natural and acquired resistance.

Chapter IV is devoted to the control of nematode infestations and, although the shortest in the book, is probably the most important from the point of view of the veterinary practitioner, who would be wise to bear in mind the author's remark that "even the law and common sense often fail to persuade human beings to take advantage of methods that are devised to protect them against disease, so that it is not surprising that it is more difficult to apply methods of control to farm animals."

The book closes with a list of 404 references, including many of quite recent date, and an adequate index. There are no illustrations. Throughout, the book is written in a condensed yet very readable style and contains in compact form a great amount of information which should stimulate the student, the practitioner and general reader with a taste for biology; its use to the clinician is limited. The volume is well produced, clearly printed, and misprints and slips are pleasantly rare, although the reviewer noticed, on p. 135, that the Swine Sanitation System is ascribed to MacClean, instead of McLean, County.

The Ministry of Agriculture has decided that there is no need for the maintenance of the regulations made by local authorities which required sheep moved into their areas from certain other districts of England and Wales to be double dipped either before movement or immediately afterwards, and an Order has been issued revoking the regulations made by local authorities under the Sheep Scab Order of 1928. The Ministry is also of opinion that there is no reason for maintaining the Order which regulated the movement of sheep into Scotland and Northumberland, and the Sheep (Movement into Scotland and Northumberland) Order, 1933, has also been revoked.

REPORTS

County of Renfrew

COUNTY VETERINARY INSPECTOR'S REPORT FOR 1936

The report refers to the work carried out under the Milk and Dairies Acts and relative Orders, the Diseases of Animals Acts and Orders and the Scottish Meat Regulations by the County Veterinary Inspector, Mr. A. M. K. Macleod, two whole-time assistants and one temporary assistant appointed in October.

Milk and Dairies Acts and Orders

County Area and Small Burghs

Visits to unregistered premises	19
Number of dairy farms visited	424
Number of visits to dairy farms	1,206
Number of cows	32,263
Mastitis	372
Non-tuberculous induration	155
Teat eruptions	122

It is anticipated that with the increase in staff it will be possible to visit every farm where cows are kept.

Large Burghs

Number of dairy farms	15
Number of visits	42
Approximate number of cows	283

A common complaint by the dairymen appears to be that their milk cans are returned to them from milk depôts unrinsed and often in contact with manure, etc., which renders their task of cleansing more laborious.

Comment is also passed that no provision is made for the proper transport of milk such as "certified" and "tuberculin tested."

Tuberculosis and Tuberculosis Order

Number of cases	112
Giving tuberculous milk	1
Tuberculosis of udder	27
Tuberculous emaciation	20
Chronic cough, etc.	64
Advanced	69
Not advanced	43

Of the 112 animals slaughtered, 71 were discovered during routine inspection of herds. The total number dealt with represents a decrease of 31·3 per cent. compared with the previous year. This is explained by the more complete control of dairy herds; the fact that numbers of farmers are making efforts to clean their herds by means of the tuberculin test and that there is an increasing tendency to make herds self contained.

Two cases of congenital tuberculosis of calves were met with. The dams were found and dealt with under the Order.

Seven reports were received that milk consigned to the large burghs and city contained tubercle bacilli. In three cases the source of infection was discovered. In one case it was found that the source of infection was a dairy farm in the area of another local authority. In the other three cases the source of infection was never discovered.

MILK (SPECIAL DESIGNATIONS) ORDER (SCOTLAND), 1936

	No. of Herds.	Average No. in Herds.	Approximate No. of Dairy Cows.	Estimated Annual Production in Gallons.
Certified ...	20	1,489	741	527,245
Tuberculin Tested ...	11	694	275	188,870
Standard ...	2	—	77	52,500

Five other herds in the county are known to be tubercle-free and a considerable number are in process of eradication.

During the year 2,849 animals in graded herds were tested with tuberculin and 49 reactors were discovered.

Tuberculosis (Attested Herds) Scheme (Scotland).—Seven applications under this scheme were made during the year. There are now six herds in the county holding Certificates of Attestation.

Bacteriological Examinations.—Five hundred and eighty-two specimens were examined microscopically in the County Laboratory by the veterinary staff. Of these, 505 were for the presence of tubercle bacilli and 75 proved positive.

Meat Inspection.—There are eleven private abattoirs in the county and these are visited regularly by a Detention Officer, who detains diseased carcases for inspection. During the year 1,118 visits were made. One burgh abattoir is supervised by a resident Meat Inspector and it is only in cases of difficulty that the services of the Veterinary Inspector are requested.

Number of food animals slaughtered	5,888
Number of carcases seized	19
Number of carcases partially seized	193

No reference is made to the disease conditions warranting seizure.

Anthrax.—The carcases affected with anthrax were removed to approved premises in a specially constructed metal box and destroyed there by heat. This method of dealing with carcases affected with anthrax has much to commend it.

Swine Fever.—The number of cases of swine fever confirmed is the largest number recorded by the Department.

DISEASES OF ANIMALS ACTS AND ORDERS

Disease.	No. of Reports.	No. of Confirmations.	No. of Microscopic Preparations Examined.	
			Positive.	Negative.
Anthrax ...	71	2	2	69
Swine fever...	12	5	—	—
Sheep scab ...	—	—	—	3
Tuberculosis	—	112	75	430

Tuberculosis Order.—At the beginning of the year a circular letter was addressed to all dairy farmers reminding them of their obligations under the Tuberculosis Order. This was followed by the largest number of reports ever received in one year. Two owners were prosecuted for failure to notify cases of the disease.

Sheep Scab.—No case of this disease has occurred in the county since 1933.

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City of Liverpool

CHIEF VETERINARY OFFICER'S REPORT FOR 1936

The report of the Chief Veterinary Officer of the City of Liverpool for the year 1936 has just been issued. It shows that there are one Chief Veterinary Officer and two Assistant Veterinary Officers employed by the Corporation of Liverpool.

The report deals with the management of the Corporation stud, comprising 246 horses, veterinary work for various committees in connection with domesticated animals and poultry, the inspection of markets, the inspection of the city's milk supply, the administration under the Diseases of Animals Acts and the management of the Corporation farm. During 1936 the Corporation Shire horses won prizes at various shows, including the Shire Horse Show in London.

It is seen that in connection with the milk supply there is a cattle population of 3,230 milking cows in Liverpool city area, housed in 35 licensed sheds, producing 10,000 gallons of milk daily. During the year under review 46 cows with tuberculous udders or giving tuberculous milk were detected in the city cowsheds.

With respect to the milk supply from outside the city, there were 49 cases of tuberculous milk being sent into the city, in which 44 farms were concerned. These cases were dealt with under the Milk and Dairies (Consolidation) Act, 1915.

In the section of the report dealing with the Diseases of Animals Acts, it is shown that 88

(*Concluded at foot of col.* 1, *page* 1122.)

N.V.M.A. DIVISIONAL REPORTS

Eastern Counties V.M.A.*

SUMMER MEETING AT GREAT YARMOUTH

The Summer Meeting of the above Association was held at "Beechcroft," Southtown, Great Yarmouth, at the kind invitation of Captain and Mrs. Shipley on Friday, July 16th, 1937. The President, H. V. Low, Esq., was in the chair, and the attendance book was also signed by the following: Messrs. A. J. Beeson, J. D. Bowie, B. M. Claxton, J. M. Currie, W. H. Dennett, T. G. Heatley, W. F. Loveless, G. T. Matthews, A. M. McDonald, N. F. Pollock, J. E. Porrett, W. Shipley, M. Senior, W. Turtill and the Hon. Secretary, H. P. Standley, junr.

The minutes of the last meeting, as published in the *Veterinary Record*, were taken as read and signed.

Correspondence.—(1) From the following gentlemen, regretting their inability to attend the meeting: Messrs. M. Bray, W. Browning, H. Buckingham, F. Castle, T. Dalling, F. L. Gooch, Sir F. Hobday, Messrs. S. E. Hill, W. F. Howes, H. J. Loveless, C. C. Nesling, E. B. Reynolds, H. P. Standley, senr., H. Swann, J. F. Thurston, P. Turner, P. R. Turner, W. Waters, W. Wortley, P. R. Webber and P. Welch.

(2) From Mr. A. G. Beynon, tendering his resignation of membership. This was accepted with regret.

(3) From the N.V.M.A., stating that the Editorial Committee is not committed to give publication in the *Veterinary Record* to papers presented to Divisional meetings, but at the same time will continue to welcome the receipt of such papers.

*Received for publication July 22nd, 1937.

(4) From Messrs. T. J. Smith & Nephew, Ltd., offering to come down and show a film dealing with the treatment of bone fractures in the dog and cat. The Secretary was instructed to write a letter of thanks to Messrs. T. J. Smith & Nephew, Ltd., and ask them to show the film at the next meeting.

New Members.—Mr. B. P. Claxton was re-elected and Mr. M. Senior was elected to membership of the Association.

Next Meeting.—It was decided that the Autumn Meeting should be held at Ipswich early in October.

Presidential Address

The President (Mr. Low) now addressed the members as follows:—

I want in the first place just to say how very much I appreciate the honour that has been paid me in making me President of this Association this year, and to thank Professor Reynolds for proposing my name, and the members for supporting the proposition.

My late father, Frederick Low, was President of this Association in the year that the National Veterinary Medical Association came to Yarmouth about 40 years ago, and in casting one's mind back to that time one cannot help being impressed by the great changes that have occurred in veterinary practice during the period that has elapsed. In those days we went on our rounds in an open gig, in all weathers, and 60 to 70 miles a day was not unusual; they are often called "the good old days," but personally I cannot help thinking that a comfortable closed car has its advantages over an iron-tyred gig. Unfortunately motor cars do not require the services of a veterinary surgeon, and as a result of their coming the horse population of the country has been enormously reduced; in fact, the work of a veterinary surgeon to-day is totally different from what it was 40 years ago, when a practitioner's energies were, I think I may say, entirely directed towards the curing of illness and disease; whereas now a most important part of our work is in the prevention of disease. With the great advance that has been made in recent years in the preparation of sera and vaccines for the cure and prevention of disease in practically all the domesticated animals, the old-fashioned drinking horn has been largely superseded by the hypodermic syringe, but I feel sure there are still a great many owners of horses, cattle, sheep, pigs and dogs who do not yet properly appreciate the value of preventative and curative inoculations.

These brief observations on the changes that have taken place and the progress that has been constantly going on would not be complete without mention of the excellent work that is now being done under the Milk and Dairies Act

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animals were slaughtered under the Tuberculosis Order. One case of anthrax was discovered in a dairy cow; two cases of parasitic mange and three cases of swine fever were found in pigs in the city and three cases in pigs sent in for slaughter.

The report includes the work carried out in connection with the various Ministry of Agriculture Orders made under the Diseases of Animals Acts.

It further deals with the work in respect of the markets, horse sales and the examination of horses prior to exportation for food.

The report gives a good survey of the work of the Veterinary Department for the Corporation of Liverpool, and no doubt much information can be gained from it which will be of help to veterinary officers in other municipalities.

and the Tuberculosis Order by members of the veterinary profession in assisting the Medical Officers of Health to ensure a clean milk supply to the public, which no one will deny is of the utmost importance.

Whether or not you agree with what I have already said, there is one point upon which I am sure you will be quite unanimous, and that is that this is neither the time nor the place for a lengthy speech. Brevity, they say, is the soul of wit, and so it is of a Presidential Address on an occasion such as this, which should be one of "all woods" rather than "all words."

The President was accorded a hearty vote of thanks for his address, on the proposition of Captain Shipley, seconded by Mr. J. D. Bowie.

The President said it gave him great pleasure to propose a most hearty vote of thanks to Captain and Mrs. Shipley for their hospitality in asking the members there that day. It was many years since the Association first came there at the invitation of the late Mr. Shipley. Major Heatley said he would like to second this proposition, as he believed he was one of those present when the Shipley Bowls Cup was first played for.

Captain Shipley, acknowledging the heartily accorded vote of thanks, said he was only too pleased to see them there and regretted that more were not able to come; he was glad to do the same as his father had done before him.

The meeting concluded with a tribute to the President for his conduct in the chair.

Bowls Tournament.—After the meeting the Bowls Tournament took place, when the Shipley Cup was won by Mr. John Porrett, who beat Mr. W. Turtill (last year's winner) in the final.

The members were then entertained to tea by Captain and Mrs. Shipley.

H. P. Standley, junr., *Hon. Secretary.*

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North of England V.M.A.*

MEETING AT NEWCASTLE-ON-TYNE

A General Meeting of the North of England Veterinary Medical Association was held in the Agricultural Department, Armstrong College, Newcastle-on-Tyne, on Friday, June 18th, 1937, when there were present: Messrs. J. J. McDowall (in the chair), J. D. Peele, F. Christopher, H. S. Elphick, J. W. Rider, J. Smith, H. S. Lightfoot, E. R. Callender, H. B. Allan, G. M. G. Oliver, J. H. Taylor, J. R. Rider, E. F. Hardwick, J. S. S. Inglis, C. Nicholson, G. S. Beattie, T. Johnston, G. Aitkinson, T. M. Mitchell, T. Wilkinson and the Hon. Secretary (W. Lyle Stewart), with Mr. J. Dewar as a visitor.

*Received for publication June 29th, 1937.

The minutes of the last meeting, having been published in the *Veterinary Record*, were taken as read and confirmed.

Apologies for absence were received from Sir Frederick Hobday, Dr. O. Charnock Bradley and Messrs. Jackson Young, Forbes, Croudace and Starkey.

Correspondence.—Under correspondence the Secretary read letters from Mr. Alexander, who wrote from Chichester, and explained that he wished to resign as he was now stationed in the South and was a member of the Sussex Veterinary Medical Association.

Dr. Bullock wrote to thank the Association for a cheque, value £22, which was sent on behalf of the Ladies' Committee.

The Secretary of the N.V.M.A. wrote asking for the list of the Division's officers for the current year.

Miss Barr, Secretary of the Darlington branch of the R.S.P.C.A., in a letter to the N.E.V.M.A., stated that the R.S.P.C.A. in Darlington intended to open a clinic for the treatment of sick animals of the poor, in conjunction with the local Division of the National Veterinary Medical Association. The Secretary, in his reply, pointed out that it should be regarded as a joint undertaking on the part of the R.S.P.C.A. and the N.E.V.M.A. and he gave Miss Barr information regarding the clinics already established in Newcastle and Sunderland. He also sent a list of regulations which were drawn up by the Association some years ago in connection with the clinics at Sunderland and Newcastle.

Mr. McDowall referred to Mr. Alexander's resignation from the Association, and suggested that the Secretary write to him and express the good wishes of the Association for his future success.

Council Report.—The main business concerned arrangements for the June meeting, when it was decided to hold the meeting on Friday, June 18th, at 5 o'clock, the main reason being a dinner proposed to be held at 7.30 p.m. It was agreed that at the meeting four members be asked to present short papers on "Hysteria and Allied Nervous Diseases of the Dog." The Council also decided that any member might bring a guest.

Elections.—Mr. McDowall proposed the election of Messrs. J. S. Inglis and J. O. Powley, Mr. Rider seconding and the proposition being carried unanimously.

Papers.—Short papers on the subject of "Hysteria and Allied Nervous Diseases of the Dog" were given by Messrs. J. D. Peele, H. B. Allan, F. Christopher and the President, followed by a discussion. [These papers, and a report of the ensuing discussion, are reproduced earlier in this issue.—*Editor.*]

Exhibits.—Mr. Oliver and Mr. Peele exhibited two similar specimens obtained from the performance of the double cryptorchid operation in horses. In each case one testicle was large and contained a piece of bone; the other was small and contained little testicular material.

Mr. Oliver mentioned a case of a pit pony, ill for about three weeks with a suspected aneurysm. The members discussed this case and were of opinion that the aneurysm was present in the iliac artery.

Later Mr. Oliver asked if a veterinary surgeon acting at a dog show should turn out a bitch in season. The general opinion was that he should not do so.

Mr. Elphick reminded the meeting of the bazaar to be held on October 5th and 6th in aid of a new R.S.P.C.A. clinic in Newcastle, and he suggested that the members' wives might like to take charge of a stall. Mr. McDowall said he felt sure that if Mrs. Elphick communicated with the ladies she would get plenty of support.

Presentation Dinner

There being no other business, the President thanked all those who had contributed to an enjoyable discussion. The members then adjourned to the University Union, where a presentation dinner was held in honour of Mr. J. R. Rider. During the dinner the President presented Mr. Rider with a bookcase as a mark of esteem and in recognition of his untiring efforts on behalf of the veterinary profession during his tenure of office as Hon. Secretary and Treasurer of the Division, a post which he had held for twelve years. Mr. J. H. Taylor supported the President's remarks, and stated that as one of the senior members he recalled how Mr. Rider had brought the Association round from an almost moribund state to its present condition of vigorous health.

Mr. Rider replied in suitable terms. The parchment scroll, which was beautifully worked by Miss Hicks, of the Art Department, Armstrong College, was engraved as follows:—

"Presented by the Honorary, Associate and General members, N.E.V.M.A., to Mr. J. R. Rider, of Darlington, as a mark of esteem and in recognition of his untiring efforts on behalf of the veterinary profession, in his capacity as Hon. Secretary and Treasurer 1925-37, and as President 1935-36."

W. Lyle Stewart, *Hon. Secretary.*

How the warble-fly causes a million pounds worth of damage a year was described by Mr. T. Dobie, M.R.C.V.S., in an address to members of the Bootle Rotary Club. Mr. Dobie, who illustrated his talk by a film, said that this country was successfully waging war on the warble-fly, and there were high hopes that it would be completely conquered in two years.

Notes and News

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events

Sept. 13th.—Meeting of the Editorial Committee, N.V.M.A., at 36, Gordon Square, W.C., 4 p.m.

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PERSONAL

Appointment.—At a meeting of the Diseases of Animals Committee of the Gloucestershire County Council, held at the Shire Hall, Gloucester, on the 17th instant, Mr. Colin Mackenzie, M.R.C.V.S., was appointed whole-time Assistant Veterinary Officer for the Northleach Division of the County.

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Birth.—Lamont. On August 13th at Mrs. Harper's Nursing Home, 8, Mount Charles, Belfast, to Mr. and Mrs. H. G. Lamont, 27, Stormont Park, Belfast, a daughter.

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THE LATE PROFESSOR J. G. THOMSON

We regret to record the death, which took place on August 13th, of Professor John Gordon Thomson, M.A., M.B., F.R.C.P., Professor of Medical Protozoology, London School of Hygiene and Tropical Medicine. Well known to a number of veterinary graduates, especially those from services overseas, as a teacher of protozoology, John Gordon Thomson was educated at Bathgate Academy and Edinburgh University, where he graduated M.A., in 1903, and M.B., Ch.B. (honours) in 1908. After a distinguished career as Durning-Lawrence research fellow in tropical medicine at Liverpool, and later as clinical and pathological research fellow at the Liverpool School of Tropical Medicine, Professor Thomson received a Beit Memorial Research Fellowship and came to London as lecturer in protozoology at the London School of Hygiene and Tropical Medicine in 1914. On the outbreak of War he was sent to Egypt where he specialised in pathology and protozoology at Alexandria, being also engaged in research on the dysenteries prevalent in Gallipoli. When he returned to England in 1918, Professor Thomson was appointed officer in charge of the malarial research laboratory at the War Office and was also appointed to the chair of protozoology at Keppel Street when the school was opened in 1918. Despite the exacting nature of his work in London, Professor Thomson twice visited Rhodesia (1921-2) where his researches on blackwater fever added to our basic knowledge of this disease, and for a time he was exchange lecturer in protozoology at the School of Hygiene, Johns Hopkins University. "Directness of approach to his subject, sound judgment, and common sense," says the *British Medical Journal*, "were characteristics of a man whose advice was sought by colleagues, who went to him the more readily on account of his friendliness and kindliness. His personal popularity and his professional reputation made it inevitable that visitors to this country interested in tropical medicine should seek him out, but, whatever the calls upon his time, he never spared himself in assisting others."

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EMPIRE CONFERENCE ON THE CARE AND AFTER-CARE OF THE TUBERCULOUS

The current number of the *British Journal of Tuberculosis** is devoted to the Proceedings of the Empire Conference on the Care and After-Care of the Tuberculous held in London last May. The meeting was opened by the Minister of Health, who, in the course of his remarks, dealt briefly with the progress which has been made during the past 50 years in reducing the incidence of human tuberculosis.

A large number of papers was presented covering various aspects of tuberculosis in man in the British Isles and the various Colonies and Dependencies. Taken as a whole these communications provide a useful summary of the efforts which are being made for the treatment and after-care of tuberculous patients. Naturally, they have no direct veterinary interest, but they provide valuable information for the student of tuberculosis.

The transactions will not appear in any other form.

* * * * *

PHOSPHORUS AND CALCIUM DEFICIENCY DISEASES AS TWO AETIOLOGICALLY DISTINCT ENTITIES

The following letter, which appeared in *Nature* (July 24th, 1937) gives in concise form a summary of our present knowledge upon the above important subject. It is recalled that our knowledge on these diseases is due very largely to the pioneering work carried out at the Onderstepoort Laboratory under the inspired guidance of the late Sir Arnold Theiler and to the unremitting labours of his staff of workers in the fertile field of research that was opened up to them.

Phosphorus Deficiency

"Vitamin D deficiency in most species of animals leads to the development of rickets, and Kay's suggestion that the real cause of experimental rickets produced under conditions of vitamin D deficiency is the assimilation of insufficient dietary phosphorus is interesting. Certainly this opinion is strengthened by the observation that low vitamin D rickets is indistinguishable from that produced by phosphorus-deficient diets in the presence of abundant vitamin D. The disease is referred to as rickets in the immature animal and as osteomalacia in the adult.

"Theiler produced evidence in 1932 that rickets or osteomalacia in bovines kept under conditions of abundant vitamin D was invariably associated with insufficient dietary phosphorus. Subsequent work at this Institute has shown this to be true for other species of domestic animals in addition to the ox. Experimental rickets, due only to insufficient phosphorus in a diet adequate in all other respects, has been produced in cattle, goats, sheep, pigs, and, recently, indications of it have been observed in the horse. Details of these experiments are being published and leave no doubt that insufficient dietary phosphorus is the causal factor in the production of rickets under conditions of vitamin D sufficiency, while insufficient calcium in the diet does not produce rachitic lesions but an entirely different bone disease.

Calcium Deficiency

"It is well known that low calcium in the rations of horses, especially if excess phosphorus be present, produces ostodystrophia fibrosa (Sturgess and Crawford, Kintner and Holt, Niimi, Theiler, etc.) but not rickets. Actually, true rickets in the horse has not yet been described in the literature. Furthermore, osteodystrophia fibrosa (osteofibrosis) is known to occur also in the goat, the dog and in some other animals, but so far its occurrence has not been associated with calcium-low diets.

"At this Institute an eight months old calf receiving daily in the diet 3 gm. calcium (CaO) and an excessive quantity of phosphorus (30 gm. P_2O_5), developed marked osteofibrosis and bone atrophy after 13 months. Abundant vitamin D was present. Two calves of the same age and receiving the same ration except that the phosphorus content was reduced to 15 gm. P_2O_5 developed osteoporosis and severe osteofibrosis during the same period. A 15 months old steer receiving daily in his ration 4 gm. CaO and insufficient phosphorus (4 gm. P_2O_5) developed rickets as a result of the phosphorus deficiency shortly after the beginning of the experiment and osteofibrosis in virtue of the calcium deficiency after 31 months, severe rickets and bone atrophy still being present. The same ration supplemented to contain abundant calcium (31 gm.) produced severe rickets and osteoporosis due to the phosphorus deficiency, but no osteofibrosis in a steer of the same age.

"Moderate osteofibrosis was produced in a goat and in a pig receiving low calcium high phosphorus in their diets, but possibly the wide ratio of calcium to phosphorus was also responsible for the severity of the disease. Osteofibrosis has not yet been produced in sheep fed on a diet low in calcium.

"Osteoporosis is merely the result of increased bone resorption; it is indicative of abnormal Ca: P metabolism, and is a transient stage in the evolution of some osteodystrophic diseases. It invariably accompanies the development of both rickets and osteofibrosis.

"The most probable explanation for the relative rapidity with which rickets was produced by phosphorus-deficient diets compared with the appreciably longer time osteofibrosis took to develop when the rations were low in calcium, is that the functions of these two minerals in the animal body differ widely. Practically all the body calcium is required for bone formation and is present in the skeleton, whereas the demands for the much more widely functioning phosphorus are far more varied than for calcium. In other words, the need for metabolic phosphorus, other than that required for ossification, probably plays as important a part in the production of rickets as a deficiency of phosphorus for bone formation alone, and hence rickets due to phosphorus deficiency appears more rapidly than osteofibrosis due to a deficiency of dietary calcium.

"It is interesting to note that, in all Marek's experiments with pigs, osteofibrosis was produced only when calcium was low or lower than phosphorus. No significance was attached by Marek to this apparent association of osteofibrosis with reduced calcium in the diet, probably because the work was done under conditions of vitamin D deficiency, and hence rickets developed in every case where osteofibrosis was produced, thus masking the association of osteofibrosis with abnormal calcium metabolism.

Brit. J. Tuberc. 1937. vol. 31. No. 3. pp. 117-258. Single copies 4s. 3d. Baillière, London.

"Our conclusion is that when enough vitamin D is present, a deficiency of phosphorus in the diet of cattle, sheep, goats and pigs produces rickets only, whereas a deficiency of dietary calcium produces osteofibrosis uncomplicated by rickets—certainly in cattle and horses and probably also in pigs and goats. Osteoporosis is invariably associated with both diseases."

P. J. Du Toit.
A. I. Malan.

Onderstepoort,
South Africa.

May 18th.

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* * * * *

FUTURE OF HORSE BREEDING

"Breeders of draught horses need have no fear of the immediate future if the dictum set out in the *Farm Economist* (Agricultural Economics Research Institute, Oxford) by Mr. R. P. Askew, an Oxford University economist, can be taken as anything near the mark," observes the *North British Agriculturist.* "There is little need to remind readers that the number of horses used for agricultural purposes has declined continuously since 1921, but that, with the recent rise in prices, breeding is again on the upgrade. While the number of horses in use on farms in England and Wales in 1936 was the lowest on record, the number of unbroken horses was the highest returned since the depression set in—namely, 146,400 compared with 133,557 in 1935, and 126,255 in 1934. It is desirable to avoid another slump, so it may be of interest to indicate the course that the horse population may be expected to follow, according to Mr. Askew, in the next few years, and while he refers solely to England and Wales, the Scottish problem is somewhat similar. As a result of the exceptionally low level of breeding in the past few years, the number of horses at work may still continue to decline for several years, since some time must elapse before the full effect of a change in breeding policy is felt. From a very interesting study of age groups, Mr. Askew estimates the total number of working horses in England and Wales in 1939 as roughly 490,000. Last year the figure was 560,700. In 1945, he states, horses in the 12 to 20 age group may be expected to be at their lowest level, corresponding with the low number of births from 1926-33, and unless the increase in the three to twelve years group is sufficient to outweigh the decline in the 12 to 20 age group, the total number of working horses will continue to fall until 1945. The lowest level in the three to twelve years group should be reached in 1937, and thereafter expected to recover slowly as the low births from 1926-34 pass into the 12 to 20 age group. Intimating the number that must be born to prevent a further fall in horses at work between 1939-45, Mr. Askew states that if the estimated 1939 level of population is to be maintained up to 1945, there must be some 390,000 horses in the three to twelve age group, and this would demand 452,430 births between 1934-42. Of these, 141,415 have already been recorded in 1934-36, leaving 311,015 to be born in the next six years, or an average of about 52,000 a year."

* * * * *

MANAGEMENT OF PASTURES

"At Aberystwyth Professor R. G. Stapledon and his colleagues are doing fine work for this country's most important crop—grass," writes the agricultural correspondent of the *Times,* in a recent issue of that paper. "Our climate and our soils, varied as they are, make grass, if it is properly managed, one of the most economical crops the farmer can grow. This is a truth that many farmers ignore when they neglect their pastures and pin so much faith to purchased feeding stuffs. The International Grassland Conference at Aberystwyth has given a timely reminder of the lessons which recent research and experiment can offer.

"Professor Stapledon has described young, succulent grass as 'the prince of feeds' and his energies have been devoted mainly to showing farmers how they can produce more of it through the year. Plant breeders can now offer species of grasses and clovers which are more leafy and more nutritious than the standard commercial strains of a few years ago. These commercial strains developed their seed-bearing capacity at the expense of other qualities which are much more important to the farmer. It is leaf and not seed-heads that the dairy farmer or grazier wants in his pastures. He wants a fresh growth of nutritious herbage as early in the spring and as late in the autumn as he can get it. Everyone has more than enough grass in the pastures in May and June. More productive pastures with a longer period of growth go well with a ploughland policy. There is land under permanent grass which would be better for the feel of the plough and, after cropping with oats or wheat, it should be reseeded with productive strains of grasses and clovers. There are now available, thanks largely to the work at Aberystwyth, strains of grasses and wild white clover which can be called "winter-green." No doubt they will be further improved and the choice widened. Even if he does not invest in these new strains the farmer can do a good deal to make his pastures more productive and more profitable by skilful management. The character of a sward can be changed entirely in a few years by the course of management. . . .

"At the grassland conference it was emphasised that the production of short grass is a matter of rotational and intensive grazing, intermittent grazing with heavy urination being followed by adequate periods of rest. Once a year the plants must be allowed to grow away to allow root development. Hard grazing at the same time year after year results in the number of species becoming very restricted and less and less grass will be developed just when it is most needed. In Professor Stapledon's words, 'Swards will recover from the most villainous of mal-

practices if such malpractices are not too long continued and if they are not put into operation at precisely the same time every year, year after year.'

"More experience is being gained about grass drying this summer, and if the first hopes raised by scientists have not yet been realised in full it is certainly a useful development in the farming practice of this country. But the artificial drying of grass for winter feeding will always be an expensive undertaking, and so far as practicable we need to adopt every measure to keep more grass growing in the pastures through the autumn and winter. By the use of proper strains, resting the pastures at the proper time, and proper manuring it has been found possible at Aberystwyth to have grass available from Christmas to the end of March with a crude protein content of 14 to 20 per cent. of the dry matter. This compares well with a good deal of the dried grass that has been produced and the cost is probably considerably less.

"It has been shown at Aberystwyth that better winter grass is obtained by resting a pasture which has been heavily grazed and saturated with livestock nitrogen than from aftermath. The advice that Professor Stapledon gives is that if aftermath is wanted for winter grazing the field should not be allowed to grow straight on after hay harvest but should be grazed heavily as soon as it will hold stock, in effect given a dose of livestock nitrogen, and then left to grow. A dressing of 1 cwt. an acre of nitro-chalk or some other quick acting nitrogenous fertiliser in early autumn has proved a great help in making winter grass."

Correspondence

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.

All correspondence must bear the name and address of the contributor for publication.

The views expressed in letters addressed to the Editor represent the personal view of the writer only and must not be taken as expressing the opinion or having received the approval of the N.V.M.A.

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COMPULSORY PASTEURIZATION

To the Editor of the Veterinary Record

Sir,—I have before me the *Veterinary Record* of May 15th containing that unfortunate article of mine of which your committee had such grave doubts that its publication was delayed for more than a year, but I am not writing about that. What I would comment upon—because such a surrender to modernity is too notable an event in our professional history to pass unnoticed—is your leading article in which you appear to withdraw officially our traditional objection to the compulsory pasteurization of cow's milk. Having regard to all the circumstances, I agree with your decision. I concur in your reasoning that in a sterilised and artificially protected country like Britain to-day, such a Homeric survival of natural life as raw cow's milk is an intolerable anachronism. And a dangerous one, because when all else is germ-free such a brew is poison to those who no longer have the natural antidote of an evolved bodily defence. Once a nation embarks upon a policy of artificial protection from germs, physical hardships, and every conceivable danger except those of the machine and the cocktail, it is bound to go forward. But forward to what and for how long?

From this distance my view of Britain is as dispassionate and in as good perspective as a man from Mars might see it. And it is not, from a biological point of view, an inspiring sight. The physical evolution of man and in some respects that of the domesticated animal in Britain would seem to be arrested and devolution to have set in.

One is entitled to assume this from your vital statistics and the increase of disease of a degenerative sort among your livestock. As regards the former and the humbug that is talked of economic reasons and fear of war as a cause of your declining birthrate, I would submit the following representative facts of past generations. My great-grandfather found the moral and economic courage in the intervals of helping Clive in India to found the Indian Empire, to have a family of a dozen children. His son, no less indifferent to selfish considerations, was able to combine the life and the pay of an infantry officer in the Indian Mutiny and after, with becoming the father of a family of eleven. My father, in safer circumstances, had seven, but I and my three brothers, all comfortably off, have only had ten children between us. How many will our sons have and how can this decline be attributed to anything but physical devolution of the nervous system? Of which, beyond a doubt, such measures of artificial protection as that of the pasteurization of milk are causative factors.

Who can help observing that, while a great pother is made over the preposterously exaggerated figure of 3,000 deaths each year in Britain from tuberculosis of bovine origin, there is no medical concern at all about the far greater physical danger of cocktails, late nights, and sexual excess, let alone the automobile slaughter. And these modern things have no evolutionary value while exposure to the dangers of raw milk certainly has.

Nevertheless, I cordially agree with your decision to withdraw our opposition to the compulsory pasteurization of cow's milk in Britain. So far as experiments on a few hungry rats are concerned, we die-hards who still secretly believe in Nature, and that our children were not fooling us when they seemed to prefer the warm milk from the cow to dead stuff from a bottle, have failed to prove our case. We have failed to show in a way that would satisfy academicians and officials that natural milk has any "significant" advantage over the pasteurized article. Thus we are bound to lose and should surrender now with proper dignity rather than lose prestige by fighting a hopeless battle. The latest findings of the Rowett Institute show that judgment must be given against us by default in a world that cannot see beyond its nose in evolutionary matters. But I have not the least doubt that this question will be reviewed and reconsidered long before the *Veterinary Record* publishes its hundredth anniversary of May 15th, 1937.

Yours faithfully,
Wakefield Rainey.

c/o Union Bank of Australia,
Perth,
Western Australia.

August 12th, 1937.

"VETERINARIUS"

To the Editor of the Veterinary Record

Sir,—To my many old friends of the "National," and Mr. Henry Gray in particular, greeting.

Some months back, in a letter to the *Record*, Mr. Gray alluded to a judicial use of the term "Vet." as indicating a complete and thorough examination generally, and also referred to its use in a similar sense by various authors. The term has always struck me as being inelegant and derogatory. So awkward an adjective, however, could not possibly escape mutilation. It was indeed its original clumsiness that reduced it to the realms of low Latin which it now occupies. Its classical form was *vehiterinarius*, (of the same origin as our English word "vehicle"). So a very early reduction in its first two syllables was almost inevitable. This was the substantive form of an adjective *vehiterinus* which meant "relating to draught," as performed by draught animals.

In the course of a little Latin reading I came into contact with what, to me, is the earliest recorded use of the word and I thought it might be of interest to our readers to know of it. It occurs in the writings of Columella—Lucius Junius Moderatus Columella, to give him his full appellation. He was a contemporary of Seneca and lived at Rome in the reign of the Emperor Nero (Seneca died A.D. 65), and uses the term both as an adjective and substantive.

Columella was the author of *De Re Rustica*, a twelve-volume work on agriculture, still extant, and also of *De Arboribus* on the culture of the vine and olive. His writings display genius as a naturalist and evince the labour of an accurate observer. He quotes Virgil, who was also a practical farmer, but in my slight acquaintance with this author I cannot recall meeting with the word and I do not think it would have escaped my notice.

In the course of one's work it is not at all uncommon to get our somewhat awkward title grievously misstated. On one occasion, after giving necessary attendance to a pony which had come into collision with a tram-car, his owner, when we entered the dining room to discuss the situation, introduced me to his wife as "Mr. B. the Veteran," and at another time when a domestic had called to interview me on behalf of her mistress, in order to make sure that I was the proper person, prefaced her remarks by asking me if I were Mr. B. the "Vegetarian." Now *Vetus Veteris*, though somewhat resembling the term discussed in its increased genitive, and signifying as it does "tried, experienced, etc.," has no real relationship to *Veterinus*. *Veterinæ-arum* is a low Latin form signifying draught animals generally.

So all this confusion has arisen through the debasing of the original word. Why *are* we so distinguished?

Yours faithfully,
W. H. Brooke.

P.S.—The above was written before I read Mr. Steele-Bodger's remarks on the monosyllabic representation of the word "Veterinarius."—W. H. B.

Avalon,
Northleigh Avenue,
Milton,
Weston-super-Mare.
August 19th, 1937.

A bullock was drowned in a foot of water at Dalton Holme Park, East Yorks, residence of Lord Hotham, recently. The beast was drinking from a stone trough equipped with a ball tap which is released by the pressure of the animal's nose. The bullock's curved horn became fastened behind an iron bar across the basin and the animal was unable to withdraw its head. The trough filled, and the bullock, held firmly by its head, was drowned.

Diseases of Animals Acts

SUMMARY OF RETURNS

Period.	Anthrax.		Foot-and-Mouth Disease.		Parasitic§ Mange.		Sheep Scab.	Swine Fever.	
	Outbreaks confirmed.	Animals attacked.	Outbreaks confirmed.	Animals slaughtered as diseased or exposed to infection.	Outbreaks reported by the Local Authorities.	Animals attacked.	Outbreaks confirmed.	Outbreaks confirmed.	Swine slaughtered.
	No.	No.	No.	No.	No.	No.	No.	No.	No.
Period 1st to 15th Aug., 1937	15	17	4	825	2	2	1	33	8
Corresponding period in									
1936	16	19	—	—	2	2	7	71	33
1935	8	10	—	—	2	2	8	72	56
1934	15	18	—	—	2	3	26	64	30
Total 1st January to 15th August, 1937	472	573	19	4,401	88	125	132	721	425
Corresponding period in									
1936	304	360	4	379	82	223	154	1,303	927
1935	233	270	34	10,208	81	166	214	1,254	738
1934	247	273	2	93	94	156	378	1,038	647

Note.—The figures for the current year are approximate only.

§ Excluding outbreaks in Army Horses.